The New England JOURNAL of MEDICINE

FORMERLY THE BOSTON MEDICAL AND SURGICAL JOURNAL

Official Organ of The Massachusetts Medical Society
The New Hampshire Medical Society — The Vermont State Medical Society
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The New England Pediatric Society — The New Hampshire Surgical Club
The New England Obstetrical and Gynecological Society
And The Neisserian Medical Society of Massachusetts

OWNED AND PUBLISHED BY THE MASSACHUSETTS MEDICAL SOCIETY

Volume 211 Number 8 | Domestic $6 per Annum, 25c per Copy Canada $7.04, Foreign $8.52 | AUGUST 23, 1934 | Published Weekly in Boston at 8 The Fenway

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The next Annual Meeting of the Massachusetts Medical Society will be held in Boston, at the Hotel Statler, June 3, 4, and 5, 1935.

OFFICERS AND STANDING COMMITTEES ELECTED BY THE COUNCIL, JUNE 5, 1934

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The New England
Journal of Medicine

VOLUME 211 AUGUST 23, 1934 NUMBER 8

DIABETES AND CANCER*

BY ALEXANDER MARBLE, M.D.†

THE presence of diabetes and cancer in the same individual is an association which promotes speculation and calls for a consideration of the possible relationship between the two diseases. For this reason a study has been made of the records of approximately 10,000 patients with proved diabetes who were included in a series of 12,000 individuals of all ages coming for diagnosis or treatment of diabetes. Among this number, 256 cases of malignant disease, or approximately 2.6 per cent of the patients with true diabetes, are known to have occurred up to the present time. This proportion will undoubtedly increase considerably, because two-thirds of these 10,000 diabetics are still living and many of them will later develop cancer. Moreover, there are probably many unrecognized or unreported cancer cases, not only among deceased patients but also among those still living.

Material. The 256 cases of malignant disease (which include eight cases of malignancy of types other than carcinoma) represent patients seen by Dr. Elliott P. Joslin and associates from 1898 to 1933. Only those cases have been included in which the diagnosis of cancer seemed definitely established either by operation, autopsy, biopsy, clinical findings or certification of death as due to cancer. Criticism may well be made that not all of these 256 cases can therefore be regarded as proved. For that reason tabulation was made of those cases in which the presence of cancer was demonstrated at autopsy, operation or biopsy by microscopic examination of excised tissue or in a few instances by gross examination of lesions exposed at operation without biopsy. In all, such "proved" cases numbered 132 or about one-half of the total number of 256. Since to use only this smaller series of 132 cases would obviously introduce gross inaccuracy in the statistical study, we have preferred to accept the larger group. As great care was used in selecting this group, we consider that studies based on it are on the whole much more accurate than if only cases were included in which the diagnosis was confirmed by actual microscopic examination of excised tissue.

Of the 256 cases, 219 are dead and thirty-seven living. The summary in table I gives the findings in detail. The data as to age, duration of disease, etc., in the living cases are calculated as of September, 1933, except that patients known to have died since that date have been included as fatal cases.

Sex. Of the 219 fatal cases, ninety-four were males and 125 females. Of the thirty-seven living cases, eleven were males and twenty-six females. Thus, of the entire series, 59 per cent were females. This higher incidence among women is to be expected since both diabetes and cancer are more common in women than in men. Joslin[1] stated in 1928 that, since 1922, 55.2 per cent of his patients were females. Bigelow and Lombard[2] found that in 1929 and 1930, of cancer deaths in Massachusetts, 57.7 per cent were in women; in the U. S. Registration Area in 1929, 55.4 per cent of cancer deaths were in women.

Duration of Diabetes. Among the fatal cases, the average age at onset of diabetes was 55.8 years and at death 62.9 years, making an average duration of diabetes 7.1 years. Among the living cases the average duration of diabetes to date is 9.3 years.

Duration of Cancer. The records available afforded a much less accurate and satisfactory idea as to the age at onset of cancer and the duration of life subsequent to the onset of cancer symptoms. In a certain number of cases it was learned years later that the patient had died elsewhere of cancer and no details of the final illness were obtained. In only 161 of the fatal cases was it possible to estimate the duration of cancer symptoms up to death and in this group the average was 1.8 years. Allowing for inaccuracies, this figure is still so much less than that for the duration of the diabetes, namely 7.1 years, that one is forced to conclude that in most instances the onset of diabetes came well before that of cancer. Furthermore, of the 161 cases, in 132 the onset of diabetes preceded that of cancer symptoms, in six the onset of symptoms of the two conditions was noted at about the same time and in only twenty-three instances did the onset of cancer symptoms precede that of diabetes. In other words, one would seem to be dealing in general with a group of diabetic patients who later developed cancer rather than with a group of patients with malignant disease who developed diabetes.

The figure of 1.8 years for duration of cancer

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symptoms agrees closely with that of 1.7 years found by Bigelow and Lombard[2] for all cancer deaths in Massachusetts in 1928.

Heredity. Of the total number of cases (fatal and living), fifty or 19.4 per cent stated that a relative had diabetes; thirty-eight or 14.8 per cent knew of cancer in the family. In only seven cases was a family history of both diabetes and cancer recorded. These data as to heredity are, however, open to two criticisms: (a) a large number of early cases are included and in this group the statistics are not so accurate as it is possible to make them now; (b) in the records available, more attention was paid to questioning about diabetic than about cancer heredity.

Severity of Diabetes. The averages of the highest blood sugar values obtained at any time in the entire series, fatal and living, were 0.22 Gm. (220 mg.) per cent (195 cases) fasting, and 0.28 Gm. (280 mg.) per cent (192 cases) at varying times after a meal. One hundred and fifty-six patients (60.9 per cent) are taking or have taken insulin at some time or other and the average of the largest daily amounts taken was thirty units. No further study of the insulin dosage was made since it was believed that no important data would be disclosed thereby.

It is a common impression that at times the severity of diabetes may seem to decrease after malignant disease has set in. Patients who have required insulin may be able to remain sugar-free even without it. We have made the same observation but find its interpretation difficult since usually the cancer patient lacks appetite, eats much less than formerly, and truly controlled conditions cannot be said to exist. Despite the fact that the apparent improvement in the diabetic condition is probably due to undernutrition, the result observed is the same and patients must be followed closely to avoid unpleasant insulin reactions. One striking example of the danger which is possible was afforded by Case No. 4277, a frail man of seventy-five years who suffered a severe attack of hypoglycemia at 2:30 a. m. while in the hospital. The blood sugar at the time was found to be 0.03 Gm. (30 mg.) per cent! The symptoms of hypoglycemia appeared ten hours after the last injection of insulin in dosage of only five units. Although he had eaten his evening meal following the dose of insulin, vomitus at the time of the insulin shock showed that most of the food had not left the stomach.

Site of Cancer. The site of the malignant growth is shown in detail in table II. Eight cases not carcinoma are included, namely two cases of lymphoblastoma (Hodgkin's type), two cases of lymphosarcoma, two cases of melanotic

TABLE I

SUMMARY OF DATA RELATIVE TO ALL CASES, FATAL AND LIVING

	Fatal Cases			Living Cases			Grand Totals		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Number of Cases	94	125	219	11	26	37	105	151	256
Age at									
Onset diabetes	55.2	56.2	55.8	56.3	54.3	54.9	55.4	55.8	55.6
Onset cancer	60.9^{73}	60.0^{88}	60.4^{161}	65.9	56.9^{24}	59.7^{35}	61.5^{84}	59.3^{112}	60.3^{196}
Death or Sept., 1933	62.6	63.1	62.9	71.5	61.0	64.2	63.5	62.8	63.1
Duration diabetes, yrs.	7.2	6.9	7.1	15.2	6.7	9.3	8.1	6.9	7.4
Duration cancer, yrs.	1.7^{73}	2.0^{88}	1.8^{161}	5.6	4.4^{24}	4.8^{35}	2.2^{84}	2.5^{112}	2.4^{196}
Family History									
Diabetes	14	31	45	2	3	5	16	34	50
Cancer	16	17	33	2	3	5	18	20	38
Highest Blood Sugar									
Fasting, Gm. per cent	0.21^{68}	0.23^{97}	0.22^{165}	0.24^{8}	0.23^{22}	0.23^{30}	0.21^{76}	0.23^{119}	0.22^{195}
Postcibal, Gm. per cent	0.28^{67}	0.28^{88}	0.28^{155}	0.26	0.28	0.27	0.27^{78}	0.28^{114}	0.28^{192}
Insulin: largest daily dose, units	28^{51}	29^{76}	29^{127}	32^{8}	35^{21}	34^{29}	28^{59}	30^{97}	30^{156}
Cases operated upon	41	60	101	7	20	27	48	80	128
Duration life after operation, yrs.	0.9^{36}	1.5^{53}	1.3^{94}	4.5^{6}	4.1	4.2^{26}	1.4^{42}	2.2^{78}	1.9^{120}
Autopsies	12	14	26				12	14	26

N. B. Apparent inaccuracy in certain figures above, as for example in the failure of the age at onset of cancer symptoms plus the duration of cancer to equal the age at death in the case of deceased females, is due to the fact that complete data were not available for each case. For this reason, small sub-figures have been inserted to indicate the number of cases actually used for calculations. Where no sub-figure is inserted, data were available on all cases concerned.

sarcoma (listed under eye and skin, respectively), one case of leiomyosarcoma of the ileum and one case of liposarcoma of the rectum.

Among the fatal cases the ten most common sites were as follows:

Pancreas	31 cases
Breast	31 "
Uterus	22 "
Stomach	17 "
Liver	14 "
Urinary Bladder	14 "
Intestine (exclusive of rectum)	13 "
Rectum	9 "
Prostate	8 "
Gall Bladder	6 "

The fourteen cases of cancer of the liver were proved in only one instance (Case No. 432) to be primary in the liver. Here the growth was found at autopsy to be a true hepatoma.

The striking point brought out by the above tabulation is the extraordinarily high incidence of cancer of the pancreas. This will be discussed at greater length later in the paper.

Among the living cases, cancer of the uterus, breast, and skin form the greatest number. It is decidedly encouraging to note the success which has attended treatment of these cases with surgery or radium or both. In table III these results are summarized.

Thus, the group of living cases proved to be made up of (a) those patients with cancers of slow growth of low-grade malignancy as of the skin, (b) those with tumors, as of the breast, uterus, or skin which lend themselves to radical and complete removal, and (c) those of recent onset. There are eleven males and twenty-six females. It is noteworthy that there are only four males in the living group other than those with skin cancers. These four have or have had cancer of the tongue, nasopharynx, urinary bladder and prostate, respectively. Case No. 7217 was living in September, 1933, 5.1 years

TABLE II

SITE OF MALIGNANT DISEASE

	Fatal Cases			Living Cases			Grand Totals		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Buccal Cavity									
Lip	3		3				3		3
Tongue	2		2	1		1	3		3
Pharynx	3		3	1		1	4		4
Digestive Tract									
Esophagus	2	1	3				2	1	3
Stomach	10	7	17				10	7	17
Small intestine					1	1		1	1
Large intestine	6	7	13				6	7	13
Rectum	5	4	9		1	1	5	5	10
Pancreas	15	16	31		2	2	15	18	33
Liver	8	6	14				8	6	14
Gall bladder	4	2	6		1	1	4	3	7
Urinary Tract									
Kidney	4	1	5				4	1	5
Bladder	8	6	14	1		1	9	6	15
Female Genital Organs									
Uterus		22	22		11	11		33	33
Ovary		4	4					4	4
Vulva		2	2					2	2
Male Genital Organs									
Prostate	8		8	1		1	9		9
Penis	1		1				1		1
Larynx	3		3				3		3
Thyroid	1	3	4				1	3	4
Lungs	2	2	4				2	2	4
Breast		31	31		6	6		37	37
Skin	2	2	4	7	3	10	9	5	14
Bone, including spine	1	3	4		1	1	1	4	5
Eye	2		2				2		2
Lymphosarcoma		2	2					2	2
Lymphoblastoma	2		2				2		2
Multiple Myeloma		1	1					1	1
Carcinomatosis	2	3	5				2	3	5
Totals	94	125	219	11	26	37	105	151	256

after removal of a prostate which was proved to contain an adenocarcinoma.

Multiple Carcinomata. Only three possible instances of multiple cancer were included in the series.

The complete surgical data regarding Case No. 1088 were kindly placed at our disposal by Dr. D. F. Jones and Dr. R. H. Sweet. The onset of diabetes was in May, 1916 at the age of fifty-five. She was operated upon five times in all and each time by Dr. Jones. At the first operation on July 21, 1916 a radical mastectomy was performed. The pathologist, Dr. F. L. Burnett, reported that "the tumor of the breast is a cancer of the medullary type; but metastases in the glands (axillary nodes) are not apparent". Then on December 4, 1917 a vaginal hysterectomy was done for carcinoma of the fundus of the uterus. The report of the pathologist, Dr. H. F. Hartwell, was as follows: "Adenocarcinoma. Small fibromyoma. Adenomatous polyp." When in 1924 she came again to Dr. Jones, vaginal examination revealed no evidence of recurrent malignant disease in the pelvis. On May 12, 1924 a carcinoma of the splenic flexure of the colon was removed by the Mikulicz procedure and the secondary closure of the bowel carried out on June 20, 1924. The pathologist, again Dr. Hartwell, reported as follows: "Adenocarcinoma of the sigmoid with metastases in the regional lymph nodes." At this time he reëxamined the microscopic slides from the former uterine tumor and concluded that the two carcinomata had arisen independently. On January 17, 1925 Dr. Jones performed an entero-enterostomy between the transverse colon and sigmoid to relieve partial intestinal obstruction. At this time he found metastases in the liver and mesenteric glands. The patient developed intense jaundice and died on March 29, 1925.

TABLE III

RESULTS OF TREATMENT OF CANCER IN SITES FAVORABLE FOR EARLY DETECTION AND TREATMENT

Site of Cancer	No. of Patients	Duration of Life Since Onset of Cancer Symptoms	Duration of Life Since Treatment Was Begun
		Years	Years
Uterus	11	5.4[1]	5.2[1]
Breast	6	5.4	5.1
Skin	10	4.9[2]	4.2

[1]Only nine cases included in average.

[2]Not including Case No. 9435 with duration of 23.0 years. In this case, amputation of the left hand and dissection of the axilla were necessary in September, 1930 because of extensive epidermoid carcinoma.

Case No. 2586 had the right breast removed because of cancer in 1917 or 1918. She reappeared in October, 1926 with a mass in the left breast and enlarged glands in the left axilla which were thought by Dr. David Cheever to be characteristic of cancer. Physical findings and roentgenograms suggested cerebral metastases. She died in the same month; no second operation or autopsy was performed.

Case No. 4201 had in May, 1915 a hysterectomy for adenocarcinoma of the uterus. In July, 1921 the left breast was amputated because of scirrhous carcinoma. She died in January, 1925 with metastatic cancer of the spine.

Operation was performed in 101 of the fatal cases with an average length of life after operation of 1.3 years. Operation was done in twenty-seven of the living cases with an average length of life to date of 4.2 years.

Autopsy was carried out in only twenty-six of the 219 fatal cases. As nearly as could be made out, the malignant disease did not differ in character, type of metastasis, or in other characteristics from that found in non-diabetic individuals.

Additional Cases. With the kind permission of Dr. James W. Sherrill mention is made of two unusual cases of cancer occurring in diabetics under his care. The first patient, a young woman, exhibited symptoms of diabetes in January, 1925 at the age of twenty-one and received insulin beginning in October of that year. She was married in May, 1928, and gave birth to a living child in August, 1930. In May, 1931, a diagnosis of carcinoma of the rectum was made. She died in October, 1933. At autopsy the primary site of the cancer was found to be in the ovary. The second patient was a man with onset of diabetes in January, 1930 at the age of fifty-seven. On treatment with diet and insulin he improved and as late as January, 1933 he seemed in good condition. When he came under observation again in July, 1933, however, he complained of gastro-intestinal distress, right-sided abdominal pain, loss of weight and weakness. He gradually became worse showing symptoms of cardiac failure and died of bronchopneumonia September 1, 1933. At autopsy a primary carcinoma of the liver (hepatoma) was found.

Other Tumors. Benign tumors have not been included although the series contains some cases worthy of mention. Thus, Case No. 7535 had a large frontal meningioma removed in 1929 by Dr. Harvey Cushing, and is alive and in good condition now. Case No. 4898 died in April, 1930 following an illness with symptoms suggesting a possible tumor of the islands of Langerhans; operation was refused and autopsy not done. Case No. 1017 had in March, 1931 at the age of forty-two a subtotal resection of the stomach for carcinoma by Dr. F. H. Lahey. In January, 1934, she was living, 2.8 years after operation and almost nine years after the onset of symptoms which for the first few years suggested peptic ulcer. She has slight, intermittent glycosuria but is not a proved diabetic and so is not included in the series. Case No. 9596 with onset of diabetes in September, 1922 at the age of 36, came on April 10, 1932 complaining of painful, discharging ears with symptoms dating back four weeks. On April 14 a right mastoidectomy was performed by Dr. L. G. Richards. Intermittent discharge and pain in the ear continued, however. On July 8, polypoid tissue was removed from the ear; histological examination showed an endothelio-hemangioma. Following a right radical mastoidectomy two days later

she did poorly, developed agranulocytosis and died on August 2, 1932.

Certain cases have been excluded because the diagnosis was not proved. For example, Case No. 6898 was thought to have carcinoma of the pancreas but findings were not conclusive, exploratory operation was not carried out, and he died suddenly shortly after hospital discharge. Case Nos. 5584, 6145, and 8645 were thought probably to be suffering from cancer of the stomach, liver (metastatic), and cecum respectively, but definite proof was lacking.

Occasionally clinical diagnoses have seemingly been proved wrong by time. Case No. 4966 was thought in December, 1925, because of clinical signs and symptoms and suggestive roentgenograms to have malignancy of the cervical spine. However, in February, 1934 we learned through the courtesy of Dr. George L. Schadt that he was still alive and active with the diabetic condition under control at the age of 72 years! In October, 1933 Dr. Schadt successfully treated him for diabetic acidosis.

In studying records the impression was gained that malignant disease of the kidney was incorrectly suspected or diagnosed fairly often. Not infrequently because of some abnormality in size or shape of the kidney outline by roentgenogram or deformity of the kidney pelvis as seen in a retrograde pyelogram, hypernephroma or other malignant disease of the kidney was discussed and these patients kept under observation. In such instances the diagnosis was not borne out by the subsequent course of the patient.

CANCER OF THE PANCREAS

Carcinoma of the pancreas deserves special mention. In the series of 256 cases of malignant disease in diabetics reported in this paper, there are thirty-three instances of primary cancer of the pancreas. Thus, these tumors comprise 13 per cent of the total, a relatively high proportion. An even higher percentage was found by McKittrick and Root[3] who state that among a total of thirty-seven cases of malignant disease in diabetics seen in a series of 2179 cases of diabetes between January 1, 1923 and August 1, 1926, twelve or 32.4 per cent were instances of cancer of the pancreas.

The above figures contrast sharply with that of 2.5 per cent for this type of lesion in the 5300 cases of cancer reported in Boston during 1920-1924 and studied statistically by Hoffman[4a]. In a more recent paper, Hoffman[4b] states that "it is probably safe to assume that when all allowance is made for perfection of diagnosis, the present mortality from cancer of the pancreas is not less than three per cent of the total mortality for all forms of malignant disease in the United States". Bigelow and Lombard[2] found (table 91) that 4.8 per cent of cancer deaths in Massachusetts hospitals in 1928-1930 were due to cancer of the pancreas. Of 52,509 deaths from cancer during the six-year period 1917-1922, the Metropolitan Life Insurance Company found[5] 668 deaths from cancer of the pancreas, an incidence of 1.3 per cent.

In table IV below are tabulated those 21

TABLE IV

CASES OF CARCINOMA OF PANCREAS IN WHICH THE LESION WAS DEMONSTRATED AT OPERATION OR AUTOPSY

No.	Case No.	Sex	Age at Onset of Cancer Symptoms		Age at Death*	Duration of		Heredity		Highest Blood Sugar		Largest No. Units Insulin Daily	Operation	Length Life after Op., yrs.	Autopsy
			D. M. Yrs.	Ca. Yrs.	Yrs.	D.M. Yrs.	Ca. Yrs	D. M.	Ca.	Fast. Gm./100 cc.	P. C.				
1	896	F	58.5	68.9	69.2	10.7	0.3	0	0	0.29	0.30	150			+
2	2034	F	52.1	52.2	52.5	0.4	0.3	0	0	0.15	—	0	+	0.3	
3	2127	M	55.1	62.5	66.1	11.0	3.6	0	0	0.17	—	64			+
4	3330	M	54.5	—	57.4	2.9	—	0	0	0.36	0.32	30	+	0.3	
5	3876	M	60.4	—	60.7	0.3	—	0	0	—	0.17	0	+	0.1	
6	4029	F	54.0	54.8	56.0	2.0	1.2	0	0	0.19	0.29	15	+	1.0	
7	4277	M	75.2	73.7	76.1	0.9	2.4	0	+	0.30	0.27	20	+	0.4	
8	5030	F	55.3	55.9	56.7	1.4	0.8	+	0	0.26	0.38	15	+	0.6	
9	5335	F	64.2	65.4	67.4	3.2	2.0	0	0	0.26	0.24	30	+	0.1	+
10	5442	F	73.2	74.0	75.0	1.8	1.0	0	0	0.33	0.35	24	+	0.2	
11	6551	M	51.3	59.0	59.8	8.5	0.8	0	0	0.15	0.16	0	+	0.3	
12	6869	M	46.0	48.6	49.1	3.1	0.5	0	0	0.19	0.40	50	+	0.2	
13	7791	M	71.8	73.8	74.9	3.1	1.1	+	0	0.17	0.29	25	+	0.9	+
14	9789	F	64.1	64.7	65.2	1.1	0.5	+	+	0.19	0.29	27	+	0.3	
15	9853	M	64.0	63.6	64.4	0.4	0.8	0	0	0.08	0.18	0			+
16	10408	M	59.5	60.0	60.7	1.2	0.7	0	0	0.07	0.19	0	+	0.4	
17	10861	F	59.5	59.5	60.2	0.7	0.7	0	0	0.11	0.29	42	+	0.5	+
18	11661	M	63.3	63.4	64.8	1.5	1.4	0	0	0.20	0.34	21			+
19	11894	F	56.6	72.8	73.1	16.5	0.3	0	+	0.30	0.44	36	+	0.2	
20	11647	F	44.0	44.6	45.0	1.0	0.4	0	0	0.30	0.36	45	+	0.3	
21	11946	F	62.0	62.3	62.7	0.7	0.4	+	0	0.18	0.23	40	+	0.3	
Averages & Totals		10 M 11 F	59.3	62.1	62.7	3.4	1.0	4	3	0.21	0.29	30	17	0.4	7

*Or in September, 1933.

cases which were definitely proved either by operation or autopsy.

Sex. There were ten males and eleven females. At the ages at which cancer of the pancreas was found there are about twice as many females as males with diabetes[6] so that actually the sex incidence was somewhat higher in males. In the literature generally, the condition has been reported almost twice as often in men as in women although in Kiefer's Peter Bent Brigham Hospital series[7] there was almost equal distribution between the sexes.

Duration of diabetes vs. duration of cancer. The average duration of diabetes in the group was 3.4 years as opposed to an average duration of cancer symptoms of 1.0 year. The average age at death (or in September, 1933) was 62.7 years. In the group of 606 cases of cancer of the pancreas studied statistically by Hoffman[8], the average duration of the disease was 10.8 months.

Severity of diabetes. There was nothing unusual in the severity of the diabetes. The average highest blood sugar was 0.21 Gm. (210 mg.) per cent, fasting, and 0.29 Gm. (290 mgm.) per cent after a meal. Sixteen of the twenty-one cases received insulin at one time or another, but in five instances (Case Nos. 2034, 3876, 6551, 9853, and 10408) the disease was very mild. Case No. 896 in 1924 required regularly large amounts of insulin and for days as much as 100 units a day or more on a diet averaging carbohydrate 52 grams, protein 60 grams, and fat 110-130 grams a day.

Operation was performed in seventeen instances. The usual procedure, other than exploration, consisted in joining the gall bladder or the common bile duct to the stomach or the duodenum in order to relieve jaundice. This palliative operation has given to some patients surprising relief for a few months. With the disappearance of jaundice, the often intolerable itching has decreased and at times the appetite and feeling of well-being has been temporarily promoted. The length of life following operation has averaged only five months, however.

Autopsy was done in seven cases. The type of tumor was reported in five instances as adenocarcinoma and in one case as "carcinoma simplex, acinar cell type".

Location of tumor in organ. There was no case in which it was recorded that the neoplasm did not involve the head of the pancreas. In practically all cases the statement was made definitely that the tumor occupied the region of the head. In Case No. 896, 6551, 7791, and 11661 the whole gland was found to be involved although to a lesser extent at the tail.

Metastases to adjacent viscera were commonly noted. The favorite sites were the liver, peritoneum, mesentery, omentum and lymph nodes.

Symptoms. The chief symptoms complained of were jaundice, abdominal pain, loss of weight and strength, nausea and at times vomiting, and anorexia. An idea of the relative importance of these symptoms may be gained from the table below.

TABLE V

FREQUENCY OF SYMPTOMS IN CARCINOMA OF THE PANCREAS

Symptom	Number of Cases
Loss of weight	18
Pain	16
Jaundice	15
Loss of strength	9
Nausea and vomiting	9
Anorexia	6

Although not every patient complained of pain and not every patient with pain had it all the time, nevertheless most patients suffered pain or marked abdominal distress at some time or other during the course of their illnesses. The pain was usually epigastric or over the region of the pancreas, although at times as with Case No. 11661, the chief discomfort was across the lower abdomen. Doubtless the location of the pain depends in large measure on the site of metastases. Loss of weight and strength was usually striking.

In Case No. 896 the symptoms of diarrhea and mild fever were so noticeable that two prominent medical consultants regarded typhoid fever as a likely diagnosis but such findings are unusual. Indeed, in only four of the twenty-one cases did the patient complain of diarrhea; constipation was the rule. In only three instances was it noted that the stools were of the type suggesting pancreatic deficiency with undigested food and excess of fats. Our records may not be complete on this point, however.

Physical findings. Other than findings mentioned above, it is noteworthy that in six cases ascites was present. The liver was usually palpable, was often found to be quite enlarged and nodular, and in each of the cases which came to autopsy, metastases were found in this organ. In about half the cases a mass was thought to be palpable in the upper mid-abdomen but in at least five of these nine cases the mass was considered to be a dilated gall bladder.

Diagnosis. Preterminally, diagnosis may offer little difficulty, but in the earlier stages of the condition, exact diagnosis is difficult. In addition to the characteristic symptoms and signs, laboratory studies usually show a secondary anemia, often absence of free hydrochloric acid in the stomach contents, and often excess of fat and absence of bile in the stools. Roentgenograms of the gastro-intestinal tract may accomplish two things: (a) rule out disease in the

stomach or intestine, and (b) in a certain number of cases, show a wide sweep of the duodenum to the right, demonstrating pressure from the pancreatic tumor.

The interesting question naturally arises as to whether in these cases diabetes may have arisen because of the involvement of the pancreas by the carcinomatous growth. The impairment of pancreatic function both as regards internal and external secretion by the encroachment of tumor tissue certainly affords an explanation for the occurrence of diabetes far more satisfying than one is accustomed to find. Although in the present series the fact that the onset of diabetes preceded by an average of 2.4 years the onset of symptoms referable to the pancreatic tumor is against such a conclusion, it must be admitted that the duration of diabetes among the cases of cancer of the pancreas, 3.4 years, is the shortest duration among any group of diabetics under observation. The consensus of other writers on the subject is that although glycosuria is not infrequent in cases of carcinoma of the pancreas, actual diabetes occurs seldom.

Among Kiefer's[7] thirty-three cases from the Peter Bent Brigham Hospital in Boston, there were only two patients who excreted sugar in the urine and neither of these had diabetes. Among 251 cases which he collected from the literature, forty-three or about one in six had glycosuria. In the carefully studied case reported by Urmy, Jones, and Wood[9] mild diabetes mellitus developed during the last one and a half years of the life of a man with proved adenocarcinoma of the pancreas in whom symptoms of pancreatitis dated back five years before death. In a case of this sort, the evidence seems quite conclusive that the diabetes was due to encroachment of the tumor tissue since at autopsy it was estimated that 95 per cent of the island-bearing tissue had been destroyed. In the case cited by Grafe[10], the diabetic condition was mild despite the fact that at autopsy the entire pancreas was involved with a carcinomatous growth and microscopic examination failed to reveal any normal pancreatic tissue. Cases with such extensive involvement are rare, however.

Possibly carcinoma of the pancreas does not oftener cause diabetes because the tumor is usually situated chiefly in the head and body of the gland. It is well known that most of the islet-bearing tissue is in the tail of the organ. Then, too, the islet tissue seems for some reason to resent intrusion. In two of our cases, Case No. 5335 and 9853, a definite note was made by the pathologist that even in tumor-filled portions of the pancreas, certain groups of islet cells could be made out despite the fact that they were entirely surrounded by malignant tissue.

In Weiss's[11] case V there was found at autopsy cystic degeneration of the pancreas with diffuse fibrosis secondary to stricture of the ampulla of Vater. Despite the fact that fibrous tissue had replaced practically all of the acinar tissue of the pancreas, the patient in life had not shown sugar in the urine and had had normal blood sugar values. This seemed to be explained by the finding of numerous islands of Langerhans, some quite large, throughout the pancreas, embedded in the connective tissue. Weiss points out the parallel which exists between this situation and that created by the experiments of Ssobolew. The latter showed that following the ligation of the pancreatic duct, the glandular tissue degenerates, but the islets persist and the animals do not develop diabetes. This fact was, of course, the starting point for the work of Banting and Best.

CARBOHYDRATE TOLERANCE IN NON-DIABETIC PATIENTS WITH CANCER

There has been much discussion as to the influence of malignant disease on carbohydrate tolerance and as to the diagnostic value of carbohydrate tolerance tests in individuals in whom the presence of a carcinomatous process is suspected. As early as 1885 Freund[12] reported the finding of hyperglycemia in nearly all of a series of patients with carcinoma. Similar observations were published a few years later by Trinkler[13]. Since the introduction of sugar tolerance tests, various workers have reported like abnormalities in patients with cancer. An added stimulus to interest in the work was given by the studies of Warburg[14] in which he showed that the behavior of malignant tissue in vitro differs from that of normal tissue in the manner in which sugar is broken down. Thus although normal tissue cells exhibit some glycolysis (i.e., splitting of sugar to lactic acid) in the absence of oxygen, under aerobic conditions practically no glycolysis is seen (except in the case of the retina and some inflammatory tissues) and glucose is broken down completely to carbon dioxide and water. Malignant tissue, on the other hand, characteristically shows glycolysis despite the presence of oxygen. Blood coming away from an extremity containing tumor tissue was shown by Cori and Cori[15] to contain less sugar and more lactic acid than that from a normal part. In one group of experiments Warburg[16] found by arterial-venous differences that per 100 cc. of blood, tumor tissue removed on the average 70 mg. of glucose as compared with two to sixteen mg. removed by normal tissue.

Unfortunately, the reports of investigations carried out clinically to ascertain the carbohydrate tolerance of cancer patients have not been entirely in agreement. The abnormalities reported by some in the blood sugar curve obtained following the ingestion of a large quantity of sugar consist not only in the height of

the blood sugar rise, which is usually only slightly above that accepted as normal, but also in the delayed return to normal.

In a series of glucose tolerance tests Olmsted and Gay[17] found that of the three cases of carcinoma which were included, two exhibited abnormal curves. The actual values for these patients are not given. Friedenwald and Grove[18] obtained somewhat similar results. They are convinced that particularly with cancers of the gastro-intestinal tract, there is a type of response following dextrose which is characteristic enough to serve as a distinct diagnostic aid. Edwards[19] interpréted the failure to obtain a type of tolerance curve regarded as characteristic of cancer as strong evidence against the diagnosis of malignant disease. Kelly[20] from a study of seventy-nine cases including twenty-eight cases of carcinoma of the gastro-intestinal tract, concludes that "while patients suffering from carcinoma show an average higher degree of blood sugar concentration than is usually the case, . . . the blood sugar tolerance test as a clinical aid in the diagnosis of cancer is of suggestive value alone, and that only when taken in conjunction with other and more positive clinical and laboratory data."

As a result of these extensive earlier studies both in patients with cancer and in patients with other disorders, it became apparent that abnormal and bizarre glucose tolerance curves may be obtained in various conditions as tuberculosis, nephritis, hyperthyroidism, pregnancy and infections. Rohdenburg, Bernhard and Krehbiel[21] after a study of 228 patients with various diseases concluded there was no type of response which may be considered "diagnostic of any given pathological condition, though, in general, conditions associated with increased growth energy show a higher percentage of type 1 reaction". (In their type 1 reaction, the blood sugar value is higher forty-five minutes after the ingestion of sugar than it was in the fasting state and still higher at the 120 minute interval. In other words, the curve obtained was more or less a straight line.)

More recently the subject has been considered anew by Jackson[22] who believes that in patients with cancer there is a lowered tolerance for carbohydrate. He states also that cancer patients with a normal dextrose tolerance respond promptly to treatment with the roentgen-ray, radium, or surgery. Beregoff[23] studied 300 patients with cancer by means of dextrose tolerance tests and the determination of the pH of the blood. She found a lowered carbohydrate tolerance in all the patients examined but considered it significant only in the presence of an alkalosis. Woodward and Fry[24] found that the average fasting blood sugar level in fifty-two untreated cancer cases was 20 mgm. per 100 cc. above normal. Enocksson[25] carried out dextrose tolerance tests on sixty cases of malignant disease including forty-eight cases of cancer of the stomach. None of the patients had any clinical signs of diabetes. He found that in all but three cases the fasting blood sugar (Hagedorn-Jensen method) did not exceed 0.12 Gm. (120 mg.) per cent and in these three it was below 0.14 Gm. (140 mg.) per cent. In every instance he obtained tolerance curves which he considered abnormal but in examining these curves in detail one notes that in twenty-three of the sixty patients no blood sugar value of 0.20 Gm. (200 mg.) per cent or higher was obtained although capillary blood was used. Furthermore, Enocksson found that the carbohydrate tolerance is also lowered in patients with active peptic ulcer.

The data presented in the present paper represent solely a statistical study on known diabetics and no first-hand data are available in connection with studies of the sort just considered. The bulk of the evidence in the literature would seem to indicate that in a large percentage of patients with cancer, certain rather slight, though definite abnormalities in sugar tolerance curves are obtained. However, in the interpretation of such data, the following considerations must be borne in mind: (1) Abnormal glucose tolerance curves have been obtained in non-diabetic, non-cancerous, patients with a variety of conditions, as peptic ulcer, tuberculosis, arthritis, nephritis, hyperthyroidism and infections. (2) Cancer patients are often cachectic and have been eating but little: overloading the body with a large quantity of sugar under such conditions may produce an abnormal tolerance curve even though no fundamental abnormality exists. (3) Mild and hitherto unrecognized diabetics may respond with sugar tolerance curves not unlike those reported. (4) Control cases in such studies should be so selected that the malignant and non-malignant cases studied are from the same decades of life and are, aside from malignant disease, in essentially the same physical condition.

DISCUSSION

In the course of a statistical study of associated causes of death (as recorded on death certificates) in individuals dying with cancer in Massachusetts during a ten-year period, Wilson and Maher[26] observed that diabetes and cancer occurred together much more frequently than would be expected on the assumption that the two diseases are independent. They state that "it would appear that either diabetics tend to develop cancer or that cancer patients tend to develop symptoms recognized as diabetic".

There are but few reports in the literature which present data as to the incidence of cancer in diabetics. In the 1928 edition of the "Treatment of Diabetes Mellitus" Joslin[1] re-

corded sixty-six deaths from cancer among a total of 1756 fatal cases (1898 to July, 1926), or 3.8 per cent. In 1931 he reported[27] the results of a preliminary analysis of 190 cases of cancer occurring among 6,357 diabetics (3 per cent). In Warren's series[28] of 300 diabetic cases on which a postmortem examination was done, there were only twelve patients or 4 per cent with malignant disease. This percentage is even less than that occurring in the general hospital series reported by Ophüls[29]; among 3000 autopsied cases (including thirty-four diabetics) he found malignant disease present in 134 instances or 4.5 per cent. Among 840 patients with diabetes treated at the Mayo Clinic in 1930 cancer was associated in thirty-nine instances[30]. In 1931 there were thirty-eight instances among 684 diabetics[31].

Bradshaw and Carber[32] found in a study of policyholders with intermittent glycosuria that the death rate from cancer was sixty-seven per 100,000 as opposed to the company average of forty-five. Dublin[33], using life insurance statistics, studied the relationship of overweight and cancer. He found that individuals who are overweight at the time they are accepted for insurance are more likely to die of cancer than those who are not. Furthermore, in this overweight group the increased mortality from cancer is paralleled by the increased mortality from diabetes.

In considering the data outlined in this present paper, it is obviously unwarranted to draw conclusions as to the incidence of cancer among diabetics from the fact that we have discovered 256 cases among 10,000 patients. This large series represents patients of all ages, patients who have been followed for years as well as those who have just recently come for treatment, and patients who have been seen at frequent intervals as well as those who have not been heard from for several years. More significant are data assembled with the aid of the Metropolitan Life Insurance Company and presented in table VI.

Thus in the "Banting" era from 1922 to 1933, the mortality from cancer amounted to 7.1 per cent of the total from all causes. This represents a 75 per cent increase over the percentage noted in the period from 1914 to 1922 when this was 4.0 per cent. That this increase is much greater than that in the general population during the same period of years is evident from a study of table VII in which are shown the data collected by Bigelow and Lombard[2] for the general population of Massachusetts. Here the increase in the ratio of cancer deaths to total deaths from 1915 to 1929 was from 11.17 to 14.62 or 31 per cent in the age-group forty to forty-nine, from 14.39 to 18.30 or 27 per cent in the age-group fifty to fifty-nine, and from 13.15 to 17.01 or 29 per cent in the age-group sixty to sixty-nine years. Hence the percentage of increase among diabetics was roughly two and a half times that in the general population of about the same age-groups.

TABLE VI

INCIDENCE OF CANCER AMONG DECEASED DIABETICS, 1898-1933*

(Experience of Elliott P. Joslin, M.D. and associates)

Period	Number of Deceased Diabetics	Cancer Deaths	Per Cent Cancer Deaths of All Deaths
1898-June, 1914	331	5	1.5
June, 1914-August, 1922	834	33	4.0
August, 1922-1933*	1572	111	7.1
Totals	2737	149	5.4

*Deaths reported up to February 6, 1933 among patients seen up to the end of 1928.

TABLE VII

RATIO OF CANCER DEATHS TO TOTAL DEATHS IN MASSACHUSETTS

(Compiled from Table 102, Bigelow and Lombard)

Year	Percentage of Deaths Due to Cancer			
	All Ages	40-49	50-59	60-69
1895	3.49	7.54	10.32	8.87
1900	4.12	8.67	11.07	9.36
1905	4.94	9.42	11.87	10.59
1910	5.77	10.38	13.20	11.33
1915	6.92	11.17	14.39	13.15
1920	7.75	11.96	17.12	14.97
1925	10.10	14.04	17.83	16.74
1929	11.16	14.62	18.30	17.01

If one considers the influence of the asserted tendency for two major diseases not to occur in the same individual ("hypothesis of independence"), a higher incidence of cancer among diabetic patients would take on added significance. However, with modern methods of treatment the controlled diabetic now approaches the normal individual more and more. His life expectancy at the time of development of diabetes is already about half as great as that of the non-diabetic and his length of life is steadily increasing. Therefore it seems logical to assume that at the present time this principle can be applied to diabetes to a less extent than to other major diseases.

Furthermore, the above data must be interpreted in the light of the following additional facts: (1) The series of fatal cases in which diabetes was associated with cancer is relatively small. (2) The statistics as regards the diabetic patients cannot be taken as entirely accurate because, particularly in the earlier part

of the thirty-six year period involved, accuracy in the recording of the causes of death was less than to-day. (3) The age at death of diabetics has increased from 46.9 years in 1914-1922 to 59.5 years in 1928[34], thus bringing more patients into the cancer zone.

This last consideration deserves especial mention. Although it is true that the average age at death of individuals in the general population has increased (from 42.0 years in 1915-1919 to 51.7 years in 1928*) in about the same proportion as among the diabetics, the increased length of life has placed relatively more diabetics in the cancer age-zone. This becomes of great importance if one considers how much more common is death from cancer in the latter part of the sixth than in the latter part of the fifth decade. One notes from tables compiled by Lund[35] that whereas in the age-group forty-six to fifty years, Massachusetts males (1920-1930) had an expectancy of dying from cancer in 1.5 years of 18.8 per 10,000 population, for the age-group fifty-six to sixty years this expectancy was 67.9 per 10,000 population, or over three and a half times as great. Likewise Bigelow and Lombard[2] (table No. 101) noted that whereas the mortality rate per 100,000 for cancer in Massachusetts in 1929 was 117 in the decade forty to forty-nine years, it was 306 in the decade fifty to fifty-nine years and 629 in the decade sixty to sixty-nine years.

This discussion may suffice to emphasize the fact that from data now available it is extremely difficult to draw conclusions regarding the incidence of cancer among diabetics. While certain evidence would seem to indicate that cancer is more common among diabetics, such a conclusion is open to serious criticism. A definite answer must await the collection of more extensive data.

SUMMARY

1. Analysis is made of 256 cases in which malignant disease and diabetes were associated. These represent cases recognized among 10,000 diabetic patients.

2. Among the fatal cases, the average duration of diabetes was 7.1 years. The average duration of symptoms of cancer was 1.8 years. The conclusion is drawn that in general, cancer develops in the diabetic and not diabetes in the patient with cancer. Evidence is lacking that cancer brings about the diabetic condition.

3. Study of available data shows that the increasing percentage of cancer deaths to total deaths during the last two decades is greater among diabetics than among members of the general population. This is thought to be due, in part at least, to the fact that the increased longevity of diabetic patients during the last decade has placed relatively more diabetics than non-diabetics in the cancer age-zone. It does not necessarily imply that the diabetic is any more likely to develop cancer than the non-diabetic individual.

4. The series includes thirty-three cases of carcinoma of the pancreas of which twenty-one were diagnosed either at operation or autopsy. The incidence of carcinoma of the pancreas was therefore extraordinarily high. In this series it was 12.9 per cent of the total number of cases as contrasted with less (often considerably less) than 5 per cent in general cancer statistics reported by others.

5. The average duration of symptoms of cancer in the twenty-one proved cases of carcinoma of the pancreas was 1.0 years; in these same cases the average duration of diabetes was 3.4 years. This latter figure represents the shortest duration of diabetes of any group of diabetics under observation. Thus a possible relationship between cancer of the pancreas and diabetes is suggested. Figures from the literature (general hospital series), however, tend to indicate that diabetes is relatively uncommon in cases of carcinoma of the pancreas.

The writer wishes to thank Mr. Herbert H. Marks of the Metropolitan Life Insurance Company for helpful criticism and suggestions.

*Data given are for Massachusetts and were kindly supplied by Miss Angeline D. Hamblen of the Department of Public Health.

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CARE OF SYPHILIS IN THE OUT-PATIENT DEPARTMENT OF THE BOSTON CITY HOSPITAL

BY JOHN GODWIN DOWNING, M.D.*

WHEN the Boston City Hospital was opened on June 1, 1864, it consisted of a Medical, Surgical, and Ophthalmic Service; in 1868, the Dermatological Department was organized, it was the first service to be added to the original make-up of the hospital. The first annual report stated that there were 559 dermatological cases treated, so that in 1871 a request was made to the Trustees for an increase in space for the treatment of these diseases; henceforth, this was a perennial request until the department was moved into its present quarters in 1925. In 1884, the attendance was 939 and in 1909 a house service of ten beds was created; in 1914 the attendance was almost doubled, consisting of 1724 patients. With the change into its new quarters, the clinic became very large and the following figures will show its growth:

Year	Visits	New Patients
1925	12,961	2,651
1926	15,172	2,545
1927	20,837	3,061
1928	20,049	3,281
1929	19,192	3,342
1930	25,644	4,247
1931	30,613	5,457
1932	39,928	6,516
1933	47,220	6,561

It is interesting to note that during the prosperity of 1929 there was a slight decrease in the total number of patients although the number of new patients continued to advance; however, with the marked depression of 1932 and 1933 the clinic more than doubled its size, and over one-third of these patients were syphilitic. The physical equipment of the department consists of sixteen examining and operating rooms, a treatment room where electrotherapy, high-frequency machines, air- and water-cooled quartz lamps are used, also carbon dioxide tanks which are all supervised by a well-trained physiotherapist. Radium plaques are applied in the Out-Patient Department but cases needing larger dosage and x-ray therapy are referred to the Radio-Therapy Department. The department has its own library and photograph room which contains numerous photographs and lantern slides; it also has an office with two social service workers; two house pupils, two graduate nurses, two undergraduate nurses, four volunteer workers, and six staff members make up the personnel.

The treatment of syphilis at the Boston City Hospital is under the direction of the Department of Dermatology; the maintenance of this association has not been an easy task at all times, for, with the ever-growing tendency of specializing in very small fields, there has been a constant effort to divide the care of the syphilitic patients into various departments depending on the particular ailments for which they first sought relief. However, if the care of this disease is divided, the patient and the community will suffer; the patient, because syphilis is not a local disease but a generalized infection, to him the most important phase of the disease is the earliest one when most can be accomplished in treatment for the prevention of the late manifestations of the disease; for the large number of late syphilitic lesions of the central nervous system and various other parts of the body prove that the disease has been inadequately treated in the early stage. Again, the patient has the advantage of being treated in a central department where the methods of therapy are definite and fairly well standardized. Regarding the community, the prevention of the dissemination of the disease is of paramount importance. The views of the public regarding the methods of transmission have heretofore se-

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riously handicapped the clinics; the significance of syphilis to the community is now definitely recognized but continued emphasis is necessary, and so the excuse for this review, to show by statistics that the disease is still very active despite the recent advances in treatment.

Since the War, recognition of syphilis as a community health problem has, more or less, lost interest; however, the Health Departments of Boston and Massachusetts have continued to follow up delinquents. The State supplies free arsenicals, printed information, and consultation service. The need of the early recognition of the disease for the protection of the community is well shown by the following case. Similar cases can be cited by all those who have much contact with the disease.

CASE: R. A. Married, aged 27. First seen, August 5, 1927. Female Surgical (Outpatient) Service, with an infection of the dorsum of finger. Diagnosis: infection of middle finger (left hand). Alcohol dressing and hot soaks advised. Seen August 6, 1927. Furuncle on dorsum of middle finger (left hand); incision and drainage.

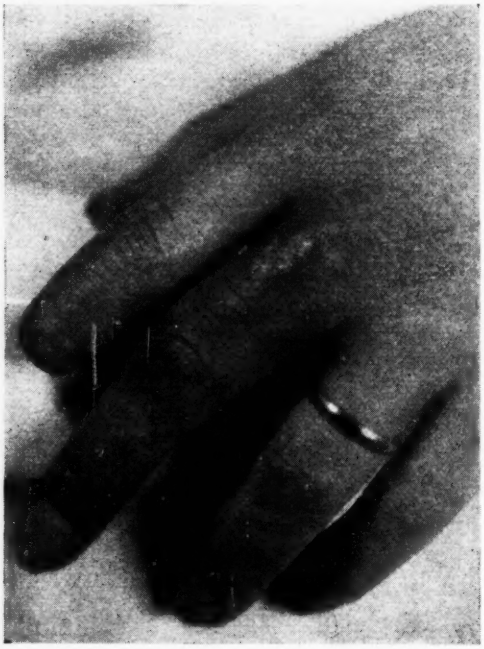

FIG. 1. R. A. Healed primary lesion on mother's finger.

First seen at Skin Clinic on January 26, 1928. Patient states that four weeks previous to the above-mentioned infection she had struck a girl in the mouth, cutting this finger on the girl's tooth; later, the finger became swollen and the glands in her armpit became very tender; the lesion, however, did not heal and she was treated by recurrent incisions and wet dressings. Two months ago, lesions appeared on her body but she thought these were due to the medicine she had been using on her hand.

Physical Examination: To-day she showed a typical secondary papular eruption with concomitant lesions and positive Wassermann and Kahn.

Social service workers were sent to investigate her home conditions and they found J. A., aged 9, who was under treatment for a septic lip; at that time, he had been under treatment for ten days despite the fact that he had marked glandular adenopathy and that the lesion was, as typical clinically as could be found. Further investigation showed that the husband of R. A. had recently acquired a penile sore which, on examination, proved also to be syphilitic.

Here are two cases which might possibly have been prevented if proper diagnosis of the original lesion on this woman's finger had been made; of course, if the original contact had been under treatment, all three could have been prevented.

FIG. 2. J. A. Primary lesion on boy's lip.

The fact that dermatology and syphilis should be under one head was recognized by the Board of Administration at this hospital on June 6, 1919 when it was voted, "all skin syphilis would be assigned to the Skin Department and all other cases of syphilis in other departments may be referred for treatment".

The number of cases of syphilis treated since 1908 are as follows:

Year	Total	Male	Female
1908	64	33	31
1909	66	40	26
1910	64	37	27
1911	57	22	35
1912	56	27	29
1913	72	41	31
1914	114	68	46
1915	225	130	95
1916	235	137	98
1917	218	117	101
1918	198	114	84
1919	334	198	136
1920	374	247	127
1921	499	307	192
1922	403	241	162
1923	196	107	89
1924	321	176	145
1925	348	215	133
1926	361	207	154
1927	569	334	235
1928	596	336	260
1929	517	295	222
1930	588	325	263

Year	Single	Married	Widowed or Divorced	Children
1908	28	28	8	
1909	35	29	2	
1910	33	26	5	
1911	24	26	7	
1912	27	24	5	
1913	36	33	3	
1914	53	55	6	
1915	105	106	14	
1916	96	127	12	
1917	99	105	14	
1918	89	98	11	
1919	153	166	15	
1920	145	175	29	25
1921	185	241	27	46
1922	144	207	18	34
1923	78	106	5	7
1924	118	149	37	17
1925	135	163	28	22
1926	131	171	33	26
1927	217	261	50	41
1928	188	304	65	39
1929	173	257	55	32
1930	221	277	55	35

A slight preponderance of males have attended the clinic, fifty-eight per cent of the total number in this series. This is due, in part, to the fact that many primary lesions in the female never give symptoms and are never observed. However, if the primary lesions are eliminated from consideration, there is still a slightly larger number of males affected. Since secondary and tertiary syphilis are recognized with equal ease in either sex, there is no doubt that the disease is more common in males, and the married are more frequently affected than the single.

Year	Primary	Secondary	Tertiary
1908	14	42	8
1909	22	34	10
1910	15	36	13
1911	16	29	12
1912	26	21	9
1913	6	31	35
1914	7	39	68
1915	24	59	142
1916	10	60	165
1917	14	49	155
1918	9	28	161
1919	56	112	166
1920	15	47	312
1921	18	74	407
1922	20	63	320
1923	15	34	147
1924	28	60	233
1925	33	101	214
1926	54	87	220
1927	73	134	362
1928	70	159	367
1929	68	155	294
1930	78	173	337

In reviewing the years here, it is interesting to note that during the War (when it is thought that venereal diseases are apt to spread) there were fewer cases than in the year 1916. Another interesting notation is the marked decrease of primary and secondary cases in 1920; this fact was evidently noticeable in other clinics as well, for in an address read to the American Dermatological Society, Smith spoke of the "vanishing lesion, a new problem in teaching," and he was worried about the lack of clinical material for teaching purposes; he gave as the four causes:

1. Early diagnosis.
2. Better treatment (early established and with arsphenamines).
3. Prohibition.
4. Education.

He stated that national prohibition will undoubtedly diminish the number of primary lesions; however, just as national prohibition did not stop the drinking in the American nation, neither did it stop illicit intercourse, so that, since that time, there has been a steady increase in the number of new cases. The economic loss due to death from syphilis and the chronic invalidism resulting therefrom make a systematic study of the disease of the highest importance. There has been a steady increase in the percentage of tertiary cases which shows evidence of inefficient treatment.

NATIONALITIES OF SYPHILITICS

Year	American	Canadian	Irish	Italian	English	Russian	Greek	Others
1908	34	6	12	3	3	—	1	5
1909	41	3	9	—	1	4	—	8
1910	30	7	12	3	1	1	—	10
1911	32	7	6	2	—	—	—	10
1912	35	1	3	4	1	2	1	9
1913	37	4	3	7	—	4	1	16
1914	64	6	9	12	4	4	1	14
1915	142	22	12	15	5	3	2	24
1916	142	9	20	13	6	2	4	39
1917	135	4	19	15	7	4	2	32
1918	88	9	14	9	4	4	2	68
1919	187	30	28	15	24	6	3	41
1920	247	25	25	15	7	7	2	46
1921	319	42	23	26	13	19	3	54
1922	300	15	37	18	6	11	2	14
1923	123	11	11	9	5	6	—	31
1924	147	16	16	12	3	4	2	121
1925	236	23	—	17	5	8	—	59
1926	241	25	12	17	5	14	3	44
1927	384	48	24	23	7	15	4	64
1928	394	47	38	27	12	12	6	60
1929	323	42	32	29	8	15	8	60
1930	393	46	26	30	5	11	9	68

An attempt has been made to determine the nationalities of the patients according to the countries in which they were born. The predominance of Americans is probably due to the fact that many of those who came to this country early in life had forgotten their place of birth.

This clinic is composed predominantly of white patients. For the purpose of convenience, the occupations of the patients were divided into the following classes:

Year	Domestics, at Home	Trade- and Sales-Persons	Laborers	Factory Workers	Cooks, Waiters	Students	Chauffeurs
1908	20	27	12	—	—	—	—
1909	14	40	5	—	—	1	—
1910	19	21	16	—	—	—	—
1911	26	19	8	—	—	—	—
1912	19	25	—	—	—	—	—
1913	21	16	11	7	7	1	—
1914	30	16	20	17	9	—	—
1915	58	46	34	33	21	4	—
1916	69	60	27	43	16	—	—
1917	68	72	27	26	13	4	—
1918	60	45	35	26	9	7	—
1919	101	69	74	36	18	12	6
1920	79	106	74	34	16	—	12
1921	129	105	83	85	15	—	15
1922	119	70	71	75	10	34	15
1923	64	39	37	22	5	17	5
1924	103	58	44	25	8	—	17
1925	124	53	49	48	13	22	17
1926	125	85	44	26	10	26	11
1927	218	91	99	46	22	41	18
1928	238	98	88	41	35	39	18
1929	206	90	67	47	20	32	16
1930	245	71	83	55	26	35	28

Year	Children	Sailors and Soldiers	Actors	Barbers	Professional	Others
1908	1	—	1	—	1	2
1909	1	—	—	—	—	5
1910	4	—	—	—	1	3
1911	2	—	—	—	—	2
1912	1	—	—	—	—	11
1913	1	—	—	2	4	2
1914	—	—	1	2	—	19
1915	—	—	3	—	4	22
1916	—	—	3	—	1	16
1917	—	—	2	—	—	6
1918	—	—	1	—	—	15
1919	—	11	—	—	—	7
1920	25	12	—	2	—	14
1921	46	5	3	—	—	13
1922	—	5	2	2	—	—
1923	—	—	1	—	—	6
1924	17	3	1	—	2	43
1925	—	7	1	—	—	14
1926	—	5	4	—	—	25
1927	—	7	2	5	—	20
1928	—	6	—	4	—	29
1929	—	3	2	5	—	29
1930	—	6	2	5	—	32

Those listed "at home" and "domestics" furnish the largest number; "trade- and salespersons" follow with twenty-one per cent; "laborers" (including railroad men) come third with fifteen per cent; "factory workers" are in fourth place with eleven per cent. Of interest in the smaller groups are the large number of cooks, waiters, and students.

The number of visits of the individual patient varied remarkably. Since the hospital clinic is a city institution, the patients first seek advice in order to determine the nature of their ailment, and a large number of them, suspecting the worst, give fictitious names so that their follow-up is absolutely impossible. To show how well these patients plan the wrong address, the author has, at various times, personally attempted to follow up interesting cases, only to find that the address given was a vacant lot. Again, the active cases are referred to the House Service for intensive treatment; a certain number of the patients are referred to private physicians for their future care; those who are at work are placed under the charge of the two night clinics which are available in the city. These various factors go to reduce the number of visits per patient, and in this way there are, at all times, a large number of new cases with active lesions present for teaching purposes. At present, there is no ward for the treatment of syphilis; but in such a large hospital there are always beds for the placement of cases in the primary and secondary stages; for those cases requiring careful analysis; for those who need diagnostic or therapeutic lumbar puncture; for malignant cases; for those who have reactions after treatment, and for cases where the process of involution after treatment may be of value to the students. The treatment of the early cases is intensive for the patients receive at least forty intravenous injections of one of the arsphenamines, and thirty bismuth treatments with frequent check-ups of the serological reactions and a spinal fluid examination both during the disease and at the termination of treatment. All cases have a complete physical examination before treatment; and late cases are studied in conjunction with the department where the tertiary lesions were first noted. There is no question (no matter how well trained a man may be in the diagnosis and treatment of syphilis) that consultation with the various specialties is always important, and the department is guided by their suggestions. There is excellent coöperation between the various departments of the hospital. Cases of congenital syphilis are thoroughly studied by the Pediatric Department and referred to this clinic for treatment.

At present, the teaching of syphilis at the Tufts Medical School is under this department, and although the time assigned to the specialty is very limited because of the numerous active cases which are always present in the clinic, there is plenty of opportunity for a student, even in this short period, to see lesions in all stages. Skin diseases and syphilis are taught together, and so there is a chance to compare the early skin eruptions with those of pityriasis rosea, psoriasis, lichen planus, drug rashes, and the many generalized eruptions which simulate syphilis.

The third-year students attend the out-patient clinic; the fourth-year men have the privilege of working in the hospital as internes, of doing dark-fields, and of taking histories; in this way, they have an excellent opportunity of watching

the progress of the disease, and at the same time, there is a good chance for comparison with cases on the medical services.

The view of the public in general regarding the transmission of the disease has seriously handicapped syphilitic clinics in obtaining contributions from philanthropists. The public needs more enlightenment leading to a broader and more liberal view regarding this specialty, and it is only by this education that we will be enabled to form a firmer foundation for teaching and research work.

ANOTHER CASE OF SPOROTRICHOSIS IN CONNECTICUT

BY ELLWOOD C. WEISE, M.D.*

IN 1931 it was the author's privilege to publish in this journal the report of a case of sporotrichosis together with a brief résumé of this disease. At that time it was pointed out that sporotrichosis was more common in New England than we are ordinarily led to believe. This statement seems to be borne out somewhat by the fact that just recently another case has occurred which was referred as one of multiple syphilitic gummata. It is quite probable that many cases are mistaken just as this one, and that they are given "mixed treatment" containing iodides to which of course they respond, and the consequent response is taken as a therapeutic proof that the condition was syphilis. Mistaken diagnoses of this type can readily be eliminated by cultural methods, which in reality are quite simple when the proper technique is followed.

In the previously mentioned communication on this mycosis, attention was called to the fact that the primary lesion (sporotrichotic chancre) may at times resemble the primary lesion of syphilis and that the ulceronodular lesions may simulate the gummata of syphilis. It was also mentioned that low-grade streptococcic lymphangitis and the ulceroglandular types of tularemia are at times imitated.

Though it is likely that a number of cases have occurred in Connecticut, the one of the late John Lane reported by Nellans[1], and the one reported by the writer[2] were the only two cases definitely proved by positive culture of the causative organism. The case herein reported, in so far as can be ascertained, will be the third in Connecticut to be recorded in the literature as having been proved by positive culture.

It is hardly necessary to recall that this mycosis is caused by a sporothrix of which there are several varieties. Various authors have from time to time described the s. beurmanni, s. schenckі, s. asteroides, s. dori, s. indicum, s. councilmanni, etc. Though the great majority of human cases have been introduced into the skin from without, there have been a few cases of generalized infection, without any apparent primary focus. These have been interpreted as arising from invasion through the mucous membrane of the gastro-intestinal tract. According to Henrici[3], Davis has produced generalized infection in rats by feeding the organism. He also states that there have been a few cases in which there was apparent primary involvement of the lungs.

Ordinarily the organism gains entrance to the body by way of some wound, often produced by some sharp object such as a thorn, splinter, grain stalk, or twig. Foerster[4] has recorded numerous cases occurring in the Mid-West in which the organism was introduced by the thorn of the barberry. After a varying period there appears at the site of inoculation a small papule or nodule which, as it continues to develop, increases in size and ulcerates, resembling the primary lesion of syphilis. At times it is possible that this primary lesion may be so trivial or of so superficial an inflammatory character, that it may clear up entirely before the secondary manifestations appear. These usually develop, after an interval of a few weeks up to about three months, as small nodules which progressively appear along the course of the lymphatics. The overlying skin becomes reddened and violaceous as the nodule increases in size and becomes fixed to the skin. This may be slightly painful. Central softening develops and an abscess forms, which breaks through the skin and discharges a yellowish or grayish-yellow pus. Involution may then take place or fistulous openings result causing the wound to take on a sluggish ulcerating appearance. These lesions appear anywhere along the course of the lymphatics, but seldom go beyond the regional lymph nodes. The patient's general condition remains unchanged. In addition to cutaneous and lymphatic involvement, this disease has been reported in mucous membrane, in bone, in the eye and in muscle tissue. Metastatic lesions may occur in the lungs, liver, and especially the testicles. Generalized cases are apparently more frequent in Europe than in America.

Campbell, Frost, and Plunkett[5] report a most unusual case of sporotrichosis in which the primary lesion or chancre was the only stage manifested. To me this is most unusual, especially when one considers that the lesion so diagnosed had been present for about five months. The

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photograph of the lesion accompanying their article appears much unlike any sporotrichotic chancre which I have seen, which simply goes to prove that the primary lesion, though often resembling a syphilitic chancre, may resemble the lesions of other diseases and thereby offer greater difficulty of diagnosis.

Another very unusual type of sporotrichosis referred to as *sporotrichosis dermique* was reported by Mount[6] in a paper read at the American Dermatological Association meeting at Toronto in June, 1931. Examination of this case disclosed a bizarre eruption made up of polymorphous lesions consisting of papules, and nodules, some of which were broken down and discharged a viscid purulent-like material. Various plaques and scars were described. The late John E. Lane in his discussion of this case suggested that more evidence be had before accepting the diagnosis. Weidman agreed with Lane urging that more work be done on the characteristics of the organism.

It is widely regarded that the organism is found, with difficulty, in smears. Lawless[7], however, in a paper published about three years ago states, "one of the chief reasons for offering this article is to affirm my belief, which is supported by experience, that one of the most reliable and rapid methods for the specific diagnosis of this condition is the isolation of the organism from pus". The following words are quoted from his summary, ". . . but to the laboratory alone is a positive diagnosis possible, by means of: (1) direct smears from the punctured nodules; . . ." The general impression is gained from this paper that one can readily discern the organism in smears. Contrary to this impression several careful and persistent observers have been able to recognize them with difficulty, if at all, in smears of pus taken from these cases. Such has been the experience of this writer in the two recent cases which have come under his care; nevertheless, the organism was readily found by cultural methods.

In pus, according to Henrici[8], it appears as a small single-celled, cigar-shaped organism. It is Gram-positive and is most frequently seen within the polymorphonuclear leukocytes. Henrici further states that it apparently reproduces by fission. These structures have been incorrectly referred to as spores. They are very much unlike the true spores found in cultures. They are far from being numerous in pus from human cases and are said to be the only structures found in the body. Though it is generally conceded that no mycelium develops in the tissues in human sporotrichosis, McDonagh demonstrated mycelium in sections of a lesion taken from Adamson's case[9]. In a case of pulmonary sporotrichosis Forbus[10] states that the fungus was found in smears taken from the pulmonary lesion in both spore and filamentous form. The cultural characteristics are described further on in this article and though the description is of the particular organism isolated in this case, it is fairly representative of the type of organism usually found in human sporotrichosis here in the East.

CASE REPORT

History: J. U., a white male, aged 34 years, was first seen in the emergency department of the Public Welfare Building about November 27, 1933 when he was examined by the resident physician who referred the patient to the dermatological clinic as one of suspected multiple syphilitic gummata. When questioned in the latter clinic it was learned that the patient had worked on a farm during August, September, and October, 1933. Because of the patient's inability to understand or speak English clearly, it was difficult to ascertain whether he first developed a "pimple" on the outer aspect of the left leg midway between the ankle and knee, which was followed by irritation from a boot rubbing against this area, or whether the "pimple" followed the friction of the boot in this region.

This so-called "pimple" gradually increased in size and ulcerated. About two or three weeks later the patient noticed firm reddened nodular areas appearing just above this ulcerating area. During subsequent weeks he noticed new nodules developing, being spaced at intervals from this region up the thigh to the level of the groin. He did not complain of any pain, nor was his general health impaired.

Examination: On November 27, 1933 the patient was examined and found to be a well-nourished male, apparently in no pain. His general condition was good; T. 98.2, P. 74. No abnormalities were noted except the cutaneous manifestations found on the left leg and thigh. These consisted of an ulcerating, somewhat granulomatous, roughly oval area (5 x 4 cm.) on the outer side of the left leg, (fig. 1). There was a scant grayish-yellow sero-

FIG. 1. Large sporotrichotic chancre on outer aspect of left leg. Note nodules adjacent to posterior border of this area; also just above it.

purulent exudate. This area in places was slightly crusted. Just beyond its upper and posterior portion were two bluish-red, slightly raised, fluctuating areas (1.5 cm. in diameter). Similar, somewhat larger lesions were present just below the patellar region. These had been painted with iodine. In this location the course of the lesions spiralled

about the inner aspect of the knee following the lymphatics up the thigh to the groin (fig. 2). The lesions (with the exception of one in the mid-thigh which had broken down and had fistulous openings) were distinctly nodular. Over the older lesions the skin was reddened or bluish-red and the nodules were fixed to the skin. Some of the newer and smaller nodules could be felt within or just beneath the skin, but as yet, the overlying skin

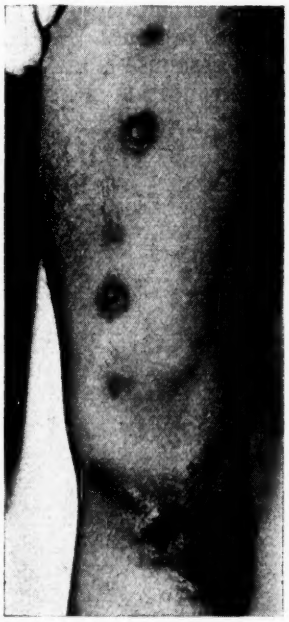

FIG. 2. Shows large fluctuating areas just below knee. These had been painted with iodine and appear of a darker shade in the photograph. Spiralling about the inner aspect of the knee, the nodules can be seen to be spaced along the lymphatics as far as the groin.

had not become reddened or was barely of a pinkish-red hue. The femoral glands were only slightly enlarged.

On this date a clinical diagnosis of sporotrichosis was made, and cultures were taken from two unopened fluctuating nodules just below the knee. On a later date cultures were taken from three nodules on the thigh showing only slight central softening. All these cultures yielded a pure growth of the sporothrix.

To attempt cultures from areas which have previously broken through the skin and are ulcerating or possess fistulous openings or sinuses is obviously unwise, as growths secured from such lesions will either *not* reveal the fungus, or will be grossly contaminated with staphylococci and other organisms.

Pure cultures can almost invariably be obtained by utilizing previously unopened lesions. In this case some were taken from older lesions, well softened, and presenting frank abscess characteristics; others were taken from rather firm and recent nodules which barely showed any appreciable central softening. The method, though simple, might be outlined: The overlying skin of the selected, previously unopened lesion, is cleansed with alcohol and painted with three and one-half per cent tincture of iodine. This is thoroughly dried. A rather large gauge (18) needle on a 2 cc. syringe is then plunged directly into the center of the lesion and the pus is aspirated. Injection of a minute amount of air into the lesions renders aspiration of the thick purulent material easier. (It is presumed sterile saline may be used for the same reason; however, it was not used in this instance.) The pus thus obtained is then dropped directly on the plate or tube culture material (Sabouraud's Medium) and spread out with a platinum loop or sterile swab.

Laboratory Examination: On November 27, 1933 cultures were made on Sabouraud's maltose agar from two fluctuating lesions below the knee. Additional cultures were made on December 8 from three more recent nodules (on the thigh) which showed only slight central softening. After several days at room temperature there was growth on the cultures from all five lesions. The growth was at first buff-tan becoming smoky-brown with age. The culture grew quite readily and in three weeks the colony on Sabouraud's maltose agar was two inches in diameter. (See fig. 3.) It was a buff-tan in

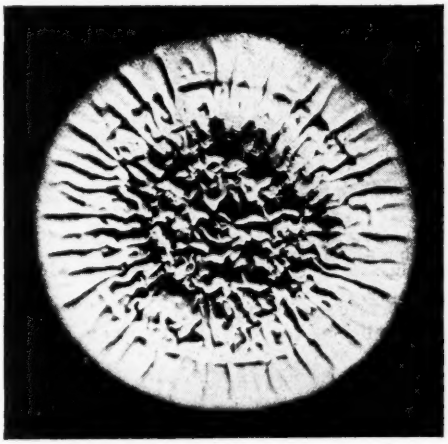

FIG. 3. Three weeks' old culture of sporotrichum schencki on maltose agar.

color with darkening to smoky-brown at the center. It was much wrinkled at the center with many radial folds to the margin. The growth, when examined under the microscope, was made up of delicate, septate, branching filaments measuring 2 to 3 microns in diameter and ovoid spores measuring 3 x 5 microns. Both the spores and mycelium were colorless. The spores were attached at the pointed end. They were borne abundantly from all parts of the mycelium, either in clusters at the tips of short side branches, or densely along the side of the main filament, forming a sleeve-like envelope. (See fig. 4.) The organism was considered to be sporotrichum schencki. (Mary E. Hopper, A. B., M. S., Mycologist at Vanderbilt Clinic, College of Physicians and Surgeons, Columbia University.)

Treatment: The patient was promptly placed on ascending doses of sodium iodide, beginning with gr. X t.i.d. and rapidly increasing to gr. XXXIV t.i.d. thus making a daily dose of about one hundred grains. Within one week slight progress was in evidence, i.e., no new lesions appeared, and a decrease in size and intensity of inflammation of the individual lesions was noted. The sporotrichotic chancre on the outer side of the leg in this particular case was relatively large, at least when compared with the chancre noted in the case which was published by the author in 1930. The granulomat-

ous characteristics were also quite pronounced. Because of this, x-ray E. D. ½ unfiltered was given to this area and a second similar dose repeated in ten days. This radiation apparently caused the area to regress more rapidly. None of the other lesions

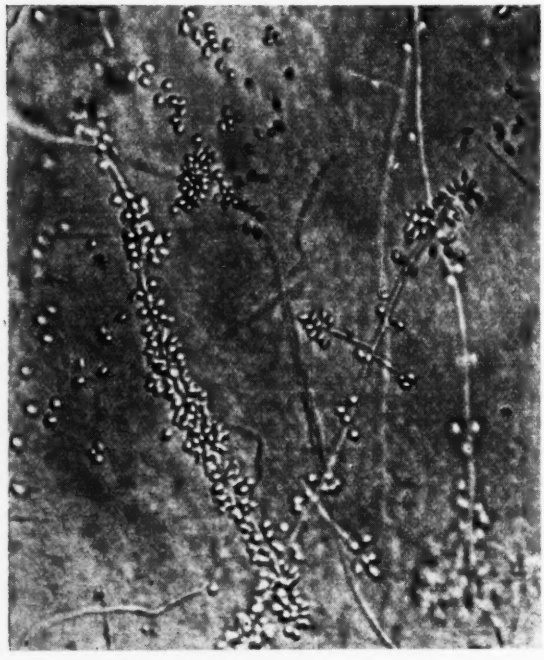

FIG. 4. Microscopic appearance of organism (500 ×). Note septate branching filaments with ovoid spores occurring singly and in clusters, being attached at their pointed ends.

received any radiotherapy. All lesions were definitely healed at the end of nine weeks (figs. 5 & 6),

FIG. 5. Shows complete healing of sporotrichotic chancre with some residual scarring and pigmentation.

at which time some scarring and fairly marked pigmentary changes were the only remains of the old lesions.

SUMMARY AND CONCLUSIONS

Another case of sporotrichosis proved by positive culture is reported as occurring in Connecticut where the disease is normally considered a clinical rarity.

So far as can now be ascertained this is the third case of this condition, occurring in Connecticut, which has been proved by positive culture and reported in the literature.

It is believed that many cases are placed on record as cases of multiple syphilitic gummata because of the response of this condition to iodides, which response is taken as a therapeutic proof that the condition so treated was syphilis.

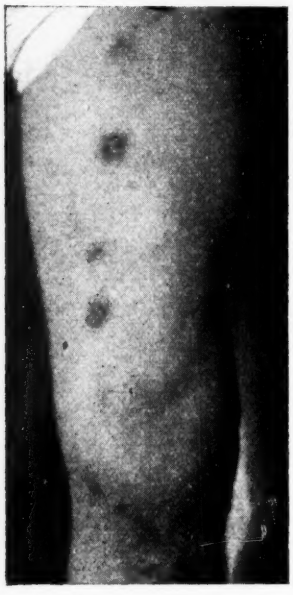

FIG. 6. Shows complete involution of nodules on thigh with some resulting scarring and pigmentation.

Therefore, attention is again called to the fact that sporotrichosis may imitate other dermatoses, particularly syphilis, and a plea is made herewith *for cultural investigation of all suspicious cases.*

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HOW CAN THE INDIVIDUAL OR FAMILY SECURE THE BEST OF MEDICAL CARE AND PAY FOR IT?*

BY CHANNING FROTHINGHAM, M.D.†

IF any one of you wanted to obtain food, clothes and an education for your child it would not be difficult to find out where the best could be obtained and how much it would cost. You could then determine whether you could afford the best, and even if you could afford it whether you would prefer to secure it or be satisfied with something less than the best. In any event on such a program you could arrange for your child to be properly enough fed, clothed and educated so that you would justly feel that you were doing the right thing by your offspring. If your child were ill, however, you would want the best of professional skill to care for it, because one cannot be satisfied with inferior service when life and health are concerned. You could, of course, dispense with elaborate nursing care and comforts, but you would feel neglectful in not trying to secure the best of professional skill. It is often difficult to know how to obtain the best advice and unfortunately it is impossible to determine in advance how much the expense for professional aid will be. Immediately, therefore, two questions arise: How can one secure the best medical care? Can one afford it?

Fortunately, the public in general has gradually realized that only well-trained physicians should be available for the care of the sick and definite standards are set up by the laws of our several states so that in theory at least only those can practice medicine who are properly prepared to do so, and therefore when you purchase medical skill anywhere you are in theory purchasing the best. On the part of the profession these standards for admission to practice are being continually improved in our different states. Unfortunately other forces are at work to lower these standards by favoring the admission of certain cultists, such as chiropractors and osteopaths to the privilege of caring for the sick in their peculiar way, which is of course really practicing medicine but without proper education for doing so. Therefore, in certain communities one must be on the alert to avoid purchasing a very inferior quality of medical service without realizing it. To simplify our discussion let us presume that we are dealing with a community in which only well-trained physicians may care for the sick.

In any community the problem of offering to the public proper medical care has become a complicated one and physicians have found it necessary to divide the work and concentrate in one or several fields. It is, therefore, essential for the layman in seeking professional aid in illness to reach the appropriate physician for his particular problem. This often is confusing for the layman to do and in his ignorance he often finds himself in the hands of some physician who is not the best suited for looking after his particular problem from a broad point of view with the result that he does not receive the best medical advice despite the fact that he is in the hands of a highly trained individual. It is important, therefore, for the layman to pay considerable attention to the organization of his medical service and in to-night's discussion the speaker will endeavor to point out how a family or individual should so organize.

The difficulty in finding the appropriate physician or securing the best of medical care is not always due to the layman's confusion because in many communities the physicians and hospitals are not organized properly to offer such service. For as our knowledge increases it is becoming more and more evident that the patient should be studied as a whole and in addition attention paid to his environment. Therefore, specialists who treat patients from too narrow an angle are working at a disadvantage and hospitals which limit their activities to certain diseases or do not have the aid of social service cannot be offering their patients the best service. Suggestions will be offered later in regard to remedying these defects in the organization of physicians for practice and hospitals for service.

In addition to explaining how the layman may secure the best medical care, the subject of this address calls for devising a scheme to pay for it. It has generally been assumed that the costs of medical care are excessive and they certainly may be in an individual case. On the other hand the Committee on the Costs of Medical Care has pointed out that the total amount of money spent on medical care is not excessive, and especially so if the amount now wasted is eliminated. Therefore, the problem of paying for medical care consists in eliminating the waste and in the distribution of this burden so that it is more evenly borne and not just carried by a few unfortunate ones. Some remarks on these points will also be made later.

One often hears a layman, who is trying to arrange for the medical care of his family or self, express the wish that the old-fashioned general practitioner would return to take care of all of his ills. Fortunately the old-fashioned

*Delivered, April 9, 1934, by invitation of the Institute of the Pennsylvania Hospital, Philadelphia.

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general practitioner has gone forever, because no one individual can properly take care intelligently of all the ills to which human flesh is heir. A layman should be careful to avoid the physician who will be willing to remove a difficult cancer, psychoanalyze the neurasthenic, perform a cesarean section on the expectant mother, remove the brain tumor, pass a cystoscope into the bladder or set the badly broken bone in addition to being on call for the more common ills throughout the twenty-four hours of each day. Specialism is essential for assistance in certain diagnostic problems and for certain types of treatment. What the individual and the family do need, however, is a medical adviser to whom they can turn twenty-four hours in the day and to whom they do turn with all of their medical problems. As will be brought out later it probably will be well for these advisers to be grouped in some way as no man can be on call twenty-four hours a day throughout the year and still keep healthy and up-to-date. This adviser and not the patient should decide when a consultation with some specialist for a particular problem is indicated.

The attempts of the layman to save time and money, or to obtain expert advice by going to the specialist directly cause in the long run much more expense and often much poorer advice, for often the specialist is unnecessary, or one specialist will send the patient on to another for an opinion about some other part of the patient's body as he naturally wishes to know about the patient as a whole and yet he may have omitted the habit of examining the patient as a whole. Often, also, much less efficient service is obtained because of the failure of the specialist to understand the environment of the patient in the manner that the general family medical adviser does. About twelve years ago a patient to whom I was at times the medical adviser and who was in the habit of drifting from one specialist to another without asking my advice called me much distressed because a certain specialist to whom she had gone on her own initiative had advised an operation to fuse certain bones in her spine because of backache. Having put the cart before the horse by going to the specialist first, she then asked my advice about the need of the operation. I told her that presumably the specialist was correct about the cause of her backache and the value of the suggested treatment, but I advised her to postpone the operation for ten days, because there are many causes of backache and she must remember that the decision upon her divorce proceedings against a useless husband was to be rendered in a week. The divorce was granted and since then I have never heard about her backache. Here you have a very perfect example of money spent uselessly for the advice of a specialist whose judgment in this particular case was not good because of his lack of knowledge of the patient's environment.

It is important to have a clear conception of what this so-called medical adviser for the family or individual should do for his patients. An attempt to describe him in the Annual Discourse before the Massachusetts Medical Society last spring apparently was not entirely successful, for I found that different opinions among the listeners were formed in regard to the place the family medical adviser should fill in the practice of medicine. Some thought that he was to act simply as a clearing house agent to direct patients to this or that specialist. Nothing is farther from the idea. The family medical adviser should be on call for medical service twenty-four hours in the day. He should be prepared by his own complete examinations to make as good a diagnosis as any one in those cases in which special technical diagnostic procedures are unnecessary. He should be the one to decide what special studies, such as x-ray pictures, cystoscopic examinations, etc., which require special technical skill should be carried out to assist him in making the diagnosis. He should not be content to blindly accept the reports from these specialists as final, but should interpret them in relation to the other findings in the case and give them their proper importance in making the final diagnosis. This family medical adviser should also be prepared to treat as many as possible of his patients' ills himself and only refer to specialists for treatment of those cases which require some special skill or equipment which he does not possess.

It is obvious that he should be the man who will make the so-called periodic health examinations if one feels that they are necessary. For the complete physical examination and laboratory studies by an isolated group of physicians who are unfamiliar with the patient and his environment offer no advantages over the examination by the general medical adviser if he is thorough and, in my experience, often are appreciably less satisfactory and even harmful to the patient's welfare. That the examination by a life extension institute may be more complete is no argument in its favor, because each layman should insist upon having a medical adviser who does complete work.

The family medical adviser must also be the individual who decides what prophylactic procedures are advisable for the members of a family and should carry them out. Specific measures for the prevention of specific diseases are increasing in number, some of them well established, such as vaccination against smallpox, inoculations to increase resistance to typhoid fever and the prophylactic procedures against diphtheria. The value of other measures, such as inoculations to prevent the common cold and prophylactic measures against measles and scarlet fever, is not so universally acknowledged.

The number of procedures which may be termed preventive has now become so numerous that the problem becomes a serious financial one if one employs all to say nothing of the question which has been raised about the desirability of injecting such a variety of toxins, etc., into one individual. Then, too, there are in some instances specific cures for certain of the conditions for which there are also prophylactic procedures. Furthermore, some diseases are much more prevalent in certain stratas of society as, for example, the prevalence of diphtheria in public school children in contrast to private school children. Other diseases are somewhat localized geographically and the problem of protection only arises in relation to travel. Time does not permit a complete discussion of these subjects, but I hope to make the point that some thought should be given to the use of these prophylactic procedures from several angles and that there should not be a blind acceptance of them on the part of the layman whenever new protective measures are suggested by their enthusiastic discoverers. The decision in regard to what prophylactic procedures should be used in each family should be reached only after consultation with the family medical adviser and the pocketbook.

It is obvious that the family medical adviser must be a well-trained physician and it is all-important that he have self-confidence enough not to be swept off his feet by the opinions of the specialists. This will naturally come with thorough training and experience. He should acquaint himself with the environmental problems of his patients. The patients should insist upon thoroughness in the work that is done for them and by their reliance upon the advice of the medical adviser give him the confidence which he needs to protect the patients from the ofttimes ill-balanced enthusiasm of the specialist. In arranging his work the family medical adviser should not have an office hour in which patients may come for diagnosis or treatment without an appointment. There is no easier way for a physician to slip into the habit of making careless and incomplete examinations than in the crowded office hours. Too many physicians will suggest some form of treatment, without first making a thorough study of the case, because of the tension of a full waiting-room. Often it is the slightest or vaguest symptom that requires the most elaborate and painstaking study and the layman must realize that he should not just drop into the doctor's office complaining of some slight discomfort and expect to be given some curative medication without a preliminary thorough examination.

In organizing for his medical care the layman must assume more responsibility than just the selection of a medical adviser. He must realize that medical knowledge has reached a point where for certain diagnostic procedures and for certain forms of treatment it is essential to have the patient under observation in a hospital well equipped with laboratories for diagnosis and other facilities for treatment. These are too expensive for any single physician or group of physicians to own and therefore must in many localities be supplied to the physicians by the community. This means that each community must have a properly equipped hospital available for all the physicians of that locality who are suitably trained. The custom of having limited professional staffs which exists in our big metropolitan teaching and charity hospitals must not exist in these hospitals supported by the citizens of a self-respecting community who expect to pay their bills. Only those physicians who do poor work or are not properly trained should be excluded from these hospitals. A limited staff to care for the charity cases in these smaller hospital units exists in some communities, but I have doubts about the desirability even of this plan. It is difficult at the present time to decide how large a community these hospitals should serve and how extensive an area can be properly covered by a single hospital. The improvement in transportation has been a great help in extending the area which may be served by one hospital. The circumstances of the different communities will eventually decide the number and distribution of these hospitals. I shall make some comments later in regard to their organization.

The attempt so far has been to make it clear to the layman that in order to secure the best of medical care he should have one physician to whom he goes for all his medical problems and that he should select a physician for this purpose who will measure up to the standards mentioned above. In addition the layman must provide his physician with suitable hospital facilities for the proper solution of certain of his medical problems. In the development of this plan some changes in the relation of the physicians toward each other and toward the public can be of great assistance. It would be a great help to the layman if the physicians were so organized that it would be easy for the layman to know who wishes to be considered a family medical adviser and who prefers to be looked upon as a specialist of some type. This could easily be accomplished if the specialists would restrict their patients to those who are referred by some medical adviser. A specialist should be a true consultant but, unfortunately, due to the tendency of the public to go directly to specialists on its own initiative, there are practically few true consultants in medicine. Except in most rare instances physicians who pose as consultants or specialists are only so in regard to seeing patients in their homes or at inconvenient hours. It is most unusual when a layman cannot make an appointment to see

such physicians in their offices without being referred by other physicians. The evils resulting from this tendency on the part of the public and the failure of the specialists to act as true consultants have been emphasized above. Some relief from this unfortunate situation could be obtained if the specialist would only make it clear to the patient who comes to him directly that the patient should have a family medical adviser and refer the patient to such a one rather than as so often happens to other specialists.

The word specialist has been used freely above and I wonder if it is clear just what is implied by the term. Would the average layman look upon a general surgeon as a specialist or would he restrict the term for those who work in a narrower field of medicine? Of course any physician who by special preparation is equipped to undertake diagnostic or therapeutic procedures which are too complicated for the family medical adviser according to this plan would be a specialist. The general surgeon certainly belongs in this group. It is not so easy to decide whether the pediatrician should be looked upon as a specialist or the family medical adviser for the early years of life. At the moment he fits in more appropriately as the latter for the infants and children, but on this program there is needless reduplication as the children grow older. With the improved teaching in our medical schools on the subject of infant feeding and pediatrics in general it is reasonable to hope that in the future the family medical adviser will take over the care of the infants and children and the pediatrician will become a pure consultant or specialist. It is important that some plan should be worked out whereby it can be easily evident to the layman who is entitled to be looked upon as a specialist.

The legislatures through the boards of registration have established laws so that a physician must have certain training before he can become a family medical adviser, but no legal provision has been made to insist that a so-called specialist has any special qualifications for the title. Any practicing physician may pose as a specialist. The medical profession is endeavoring to make a distinction in its ranks among the family advisers and those who are qualified to do special work through such organizations as the American College of Surgeons and by other plans for demonstrating special ability. It is hoped that the laymen through some changes in the laws may supplement this work.

Already attention has been called to the necessity of some kind of grouping of physicians, especially family medical advisers so that continuous service to the patients may be rendered and still opportunity offered to the physicians for further learning in order to keep them up-to-date on recent advances. In addition, vacations are essential. Several different types of groups are in existence to-day ranging from the simplest in which a physician has an assistant to elaborate combinations of general medical men and specialists. Just what the ideal method of grouping physicians for practice will eventually turn out to be is perhaps uncertain. Only a simple suggestion for grouping and a criticism of a prevalent existing custom will be mentioned to-night. The speaker feels that it would be desirable to have two or more family medical advisers of approximately the same ability group together so that if one were away for study or vacation his patients would not have to rely solely upon an assistant of less experience. The same would apply to specialists who are doing the same type of work.

The grouping of physicians which seems most open to criticism is the one which includes a combination of specialists and family medical advisers. One of the main disadvantages of such a combination is the tendency for the family medical adviser to refer to some one else in the group for many of the tests which he should do himself. This custom gradually diminishes the efficiency of the medical adviser both as to his methods of examination and his assumption of responsibility for making the final diagnosis. Furthermore, this grouping must tend to limit the number of specialists upon whom the medical adviser would call and stimulate the tendency to call upon a colleague in his group who may be good enough rather than upon some one outside the group who might be a bit better fitted for that particular problem.

The solution of the problems mentioned above regarding the organization of the physicians, so that they may offer to the public the best of medical service, must be attained in good part by the activities of the physicians. The laymen may help by improving the standards for admission to practice and by discrimination in the selection of their physicians. When it comes, however, to the organization of hospitals so that they will function most efficiently, the layman plays a much more important part for the following reasons: The hospitals are built and supported in good measure by the layman's money, citizens other than physicians usually form the majority of the boards of trustees, and the trustees actually make the final decisions in regard to the organization of the hospitals. Therefore, the trustees of a hospital should give considerable attention to the question of whether their hospital is organized so as to render the best of medical care for its charity patients and to offer to its physicians opportunities to practice medicine and surgery in the most up-to-date manner. Furthermore trustees should insist on enough rules for those who use the hospital so that physi-

cians who may be inclined to be careless or neglectful will have to live up to certain standards in their work in that institution. Usually many of the rules and methods which apply to the care of the charity patients in a hospital can be so presented to the physicians who use the hospital for their private patients that it will be to their advantage to follow these suggestions.

Unfortunately at the present time many of our hospitals present defects, in their organization for the care of the charity cases, which interfere with their rendering the most efficient service. A striking example of one of these defects in organization is the custom of appointing the chief of staff (medical, surgical, etc.) according to seniority rather than ability. There is no other successful business in which this procedure remains and fortunately in the hospitals connected with medical schools this custom has nearly disappeared. Trustees should insist that the custom be abolished in all hospitals. It is much easier for the trustees to institute this reform than it is for the members of the professional staffs from which these chiefs of service may be chosen.

Another serious defect in some hospitals is the failure to have the professional staff so organized that a continuity of program in regard to diagnosis and treatment persists throughout the year. Instead of a so-called rotating service in which every so often during the year a new physician takes charge and institutes his own ideas irrespective of what his predecessor was doing, there should be a chief of service responsible throughout the year for that particular service. This does not mean that his associates and assistants do not have any responsibility or say in the care of the patients, but it means that when they are on duty they will be following out a definite, permanent program. This program for the diagnosis and care of the patients will have been worked out by all the physicians on this service under the guidance of the chief. It will represent the best which this group of physicians can devise. It should be put in writing and made available for the physicians and nurses who are actually on duty, and finally it must be kept up-to-date by frequent conferences of the staff. In this way a change in program which only brings confusion to the nursing staff and less effective treatment for the patients will not develop with a change of visiting physician, due to some idiosyncrasy of that individual. Such a program in the Faulkner Hospital in Boston is incorporated in what is called the "Precedent Book," and it is interesting to note how much, and increasingly so, it is being followed by the physicians in the care of their private patients.

In many hospitals a change is needed in the method of admitting charity patients who are to be cared for by the general staff. Fortunately in some hospitals a so-called diagnostic service has been developed on which the entire staff, including physicians, surgeons and other specialists, takes part in the work. To this service all charity patients are admitted for diagnosis before treatment is instituted rather than being sent by the guess of the admitting officer or on the recommendation of the outside physician to some special service as medical, surgical, or neurological, etc. After the patient has been properly diagnosed, whether it takes a few moments or several days he may be transferred to some special service in the hospital for treatment. Unfortunately, however, in many hospitals patients are distributed by the admitting officer, ofttimes not even a physician, to some special service directly upon admission. This custom applies both to the patients admitted to the wards and to the out-patient department. Some of the evils of this distribution of patients directly to special services instead of to a diagnostic service were made apparent by the speaker a few years ago after a study of what actually happened to patients admitted directly to special services in one of the well-known hospitals in Boston, where the most conscientious diagnosis and skillful care of patients are carried out on all the services. It was found that if a patient arrived at the admitting office with vague abdominal pain there were ten times the chance that he would be operated upon for chronic appendicitis if he were admitted to the surgical service than if admitted to the medical service. Obviously something is wrong in an organization which permits such a discrepancy in diagnosis among a group of physicians who are working in intimate relationship. In this same hospital in the department for out-patients two cases with the same complaint were referred by the admitting clerk, one to the surgical and the other to the medical clinic. In one instance the record of the case describing the history, examination and laboratory studies comprised a scant half page; in the other, the report of the diagnostic procedure filled over two pages. Obviously such discrepancy means either that one patient was not completely and properly studied or that a great deal of time and money were wasted upon the other.

The trustees of hospitals should insist, therefore, that their professional staffs should organize in such a way that all charity patients are admitted to a diagnostic service both in the department for out-patients and in the wards, which service for the hospital corresponds to the family medical adviser in private practice.

The type of these community hospitals in many instances must be modified if the best of service is to be rendered the community with a minimum of costs. It becomes more and more evident that a patient should always be considered as a whole and not from the point of view of the most obvious disturbance. Therefore, irrespective of what the disorder is, the patient

may at any moment in the course of a stay in a hospital need complete studies and most patients should have them. It has been pointed out above, that for complete studies elaborate and expensive equipment may be needed. Hospitals which are limited to some special problem such as mental disorders, obstetrics, gynecology or orthopedics may hesitate or cannot afford to buy elaborate equipment for general diagnosis and treatment, so the patient cannot be completely cared for in that hospital. Also the extra overhead expense of separate administrative service, heating plants and the like is another reason for avoiding the hospital limited in its activity, because each community must also have its general hospital. The custom of caring for private and charity patients in the same hospital has now become definitely established in American medicine and of course is a definite advantage and will help to eliminate the abuse of charity which now exists about which I will speak later. Each community should demand of its hospital trustees that they so organize the community hospital that any disease, including contagious and mental disorders, in any member of the community rich or poor, may be diagnosed and treated in it. Only in this way can the individual be treated and studied as a whole with a minimum of expense and a maximum of efficiency. Of course from time to time some special genius like your own Chevalier Jackson will so far surpass others in technical skill that for a while very specialized problems will have to be referred to certain clinics, but gradually even these new procedures will spread to the community hospitals if they are kept up-to-date as complete units.

In summing up the way in which the individual may obtain the best of medical care either as a private or charity patient, let me emphasize again that each family or individual should have a family medical adviser to whom all medical problems should be referred. The family medical adviser should also be supplied with a complete hospital to which he may refer such cases as need hospitalization for one reason or another. For the charity patient the diagnostic service in the hospital will act as the family medical adviser. Attention has also been called to the fact that certain changes from existing customs on the part of the public, the profession and the trustees of hospitals are essential in order to offer to the layman the opportunity to secure the best of medical care in all instances. Suggestions in regard to these changes have been mentioned above and I hope that questions and discussion in regard to them will come later.

The final part of the subject of this address calls for a discussion in regard to how the best of medical care can be paid for. As pointed out above the costs of medical care taken as a whole are not excessive even if there is included in the whole cost the money wasted by the layman in useless therapy or in poor organization of his medical service. If we can eliminate this waste the total cost of medical care will be all the more reasonable, and the problem becomes simply one of distribution of this cost. Before taking up the various suggestions in regard to the distribution of this financial burden, I wish to call attention to some of the ways in which money is wasted on health. It has already been pointed out how patients will pile up expense by going directly to specialists when the family medical adviser could probably handle the problem better. Attention has also been called to the danger of being shunted from one specialist to another if one starts by going to a specialist in the first instance.

Especially wasteful is the custom of the layman to seek treatment of symptoms of self-diagnosed conditions usually by medication bought at a drug-store. The prevention of this waste of money can only be accomplished by the education of the public. The most important point is for the layman to realize that treatment should not be instituted before a diagnosis is made. The layman must also realize that drugs are only one of many therapeutic procedures that the physician may use. Unfortunately there are still doctors who think it is necessary to satisfy the patients by giving them some form of medicine and also patients who demand this form of treatment, but education is slowly eliminating this custom. An explanation to the patient that many diseases are self-limited and will subside just as quickly without medication as with it should eventually persuade the public that much money is spent needlessly on medicines taken on the advice of a friend or the drug clerk. In addition to wasting money by buying medicines which are not needed, further unnecessary expense is incurred by buying a medicine sold under some proprietary name at a price far in excess of that for which the same medicine could be bought under its official name. In this regard physicians are apt to prescribe the drug by the proprietary name instead of by the non-proprietary equivalent as described in the United States Pharmacopeia, The National Formulary or New and Non-Official Remedies. The profession certainly needs to reform its customs in this regard.

Vast amounts of money are also spent on the inappropriate treatment of conditions improperly diagnosed by the cultists such as the osteopaths, chiropractors and Christian Science Healers to say nothing of the various posture experts and irrigators of the lower intestinal tract. They often do harm as well as drain the pocketbook.

There are probably very few physicians who have not had the experience which is all too common with me of having a patient confess to

having been treated by one of the cultists mentioned above before coming to see the physician. What is even more distressing is to have the patient say that he is sorry but all the money that he can spend for medical advice has been given to the cultist without apparent benefit. Will the physician, therefore, excuse him from paying anything? This needless waste of money would in great measure cease if the layman would realize just what these cultists really are and do. The training in the various cultists' schools is entirely inadequate to prepare one for making a diagnosis. An examination of their curricula will show that it is impossible to obtain a knowledge of disease, its diagnosis and its treatment by such training. It is interesting to note that in my experience every patient who has been to an osteopath or chiropractor before coming to consult me has reported that the cultists found some lesion which needed attention. An experience at the Peter Bent Brigham Hospital in Boston shows how vague this lesion may be. For a few years ago two sincere osteopaths who stood well in their profession carried on an experiment on a series of about two hundred cases of known disease at the Peter Bent Brigham Hospital in Boston, with the object of localizing the so-called osteopathic lesion along the spine in these cases. They worked independently of each other and found one or more lesions in each case, yet they only agreed upon the location of the lesion in fifteen per cent of the total number. Sad would be the results for the patients if the medical profession could only detect a broken bone or a case of pneumonia in 15 per cent of the patients suffering from these conditions. As these cultists are not in a position to diagnose disease, they are simply individuals who treat symptoms by special manipulative procedures without knowing just what condition they are treating, and by methods which have not been proved by experimental or laboratory methods to be effective against any recognized pathological condition. It certainly should appear foolish to the laymen to begin treatment for a condition which has not been diagnosed or with an individual who is incapable of making a diagnosis. More foolish and extravagant yet it should appear when one realizes that such treatment has never been proved to have accomplished a cure of any recognized pathological condition. It would be foolish for the medical profession to say that the Christian Scientist, the osteopath, the chiropractor, etc., have not relieved people of symptoms, but it is not an exaggeration to say that satisfactory evidence has never been produced that these methods have influenced pathological conditions of a demonstrable nature in the human or animal body. Furthermore, almost every physician is familiar with instances in which disease was spread by the failure of the cultists to diagnose correctly some contagious condition, or in which the opportunity to cure some condition which became fatal because appropriate treatment was not instituted at once was allowed to pass while the cultist instituted ineffectual treatment based on improper diagnosis. Therefore, what individuals are paying for in treating with the cultists is an attempt to alleviate symptoms treated without knowledge of their cause. How much more intelligent it is to find out first the cause of the symptoms and then seek the best way to cure the disease which also in the long run will be the most economical method.

The solution of the problem of the cults is simple if the lawmakers will only realize that the cultists practice various forms of treatment for disease, and therefore, the lawmakers should insist that the cultists have the same knowledge of disease as that required of physicians. If the various states will insist upon a single standard, so far as knowledge of disease is concerned for all those who practice treatment, the cultists will become educated men in regard to medicine. When the cultists learn about disease it is reasonable to hope that the harm done by them and the money wasted upon them will appreciably diminish.

Although the amount of money now expended on medical care is not excessive and the amount can be appreciably reduced if the waste mentioned above is eliminated, the problem of the distribution of this unexpected burden still remains a difficult one to solve. If the physicians do not have to make the individual sick ones pay for heavy overhead expenses in the way of equipment for diagnosis and treatment but can have these overhead expenses distributed throughout the community, one step toward dividing the burden will have been made. The establishment of hospitals supported by the local communities is a definite step in this direction and as mentioned above each community should see that it supplies its physicians with such equipment.

Another step toward evening the burden of the payment for medical care would be to eliminate the abuse of charity which exists so far as medical fees are concerned in most of the charity clinics in our cities both in the wards and out-patient departments. If many of those who receive free advice contributed something for it, the demands upon those who do pay professional fees would not have to be so heavy. Some patients go to these charity hospitals as they would go to a family medical adviser; others who perhaps pay their family adviser go to the free clinics for consultations. This makes the financial ability of those who come to the charity hospitals quite variable and adds to the

confusion of those who try to see that no abuse of charity exists. Despite this, one meets in these clinics patients of quite different financial status who come to the hospital for the same purpose and who do not pay any professional fee. Some reorganization of the custom of not allowing any of the patients in the wards and out-patient departments of these charity hospitals to pay a professional fee must be undertaken. That it is practical to do so is demonstrated by those community hospitals described above in some of which patients in the open wards are supposed to pay some professional fee in many instances.

Even under ideal circumstances with all the opportunities for improvement mentioned above put into effect, the problem still exists that suddenly a severe financial burden may descend upon any one individual without previous warning, and with the advances in medicine this sudden burden tends to become heavier rather than lighter. As a result the layman is endeavoring to work out some plan to provide against this possibility and already various schemes are being developed and tried throughout the country. Many of these schemes are simply insurance in one form or another, some are different types of contract practice, and still others are attempts on the part of the local governments to supply medical treatment with the proceeds of taxation. One hears a good deal about so-called "state medicine" as though it were something which might be tried in the future. At the moment there is not a state in the Union which is not practicing medicine, so that if "state medicine" is going to become more comprehensive it will simply be an extension of an already existing practice.

It may eventually develop that the existing custom of paying for illness as it occurs will survive and that the individual layman will provide more carefully for the possibility of this unexpected expense. It seems very unlikely, however, that this will happen without more and more experimenting with some of the schemes mentioned above and I feel that it is exceedingly important for the medical profession to keep an open mind in regard to various proposals for contract practice and insurance schemes with the realization that quite different programs may be needed to meet the requirements of different communities or even different groups in the same community. The tendency for organized medicine, as demonstrated in The Statement of Principles and Ethics of Medical Practice of the Philadelphia County Medical Society, published in June, 1933, to dictate to the physician and layman what he shall and shall not do seems to me unfortunate. A more progressive attitude and one which should in the long run prove more satisfactory is to try out the various schemes for solving this problem of paying for the cost of medical care as they are presented by laymen and physicians and have faith that eventually the fairest ones will survive because of their merit rather than to try to kill off the unfair ones by rules which attempt to govern the activities of the physicians.

Irrespective of what scheme or schemes are adopted to help the layman pay for his medical care, I feel very strongly that for the good of the profession a patient should have the privilege of selecting his family medical adviser and specialists from at least a limited number of physicians on each occasion when need arises, and that this physician should be reimbursed by a fee for his services rather than paid by a salary. For there is no greater stimulus to a professional man than the realization that the next opportunity to earn a fee is very closely connected with the success he has had in earning the preceding ones. To substitute for the stimulating effect of this fee system the stagnating influence of a salary would be a distinct step backwards in our attempts to keep each community provided with the ablest physicians.

METHODS OF TESTING AND MANAGEMENT OF THE DEAFENED SCHOOL CHILD*

BY EDMUND PRINCE FOWLER, M.D.†

IT is a privilege and an honor to be invited to address the New England Otological and Laryngological Society. I shall speak on "Deafness in School Children, Methods of Testing, and Management", a subject which has been my pet obsession for many years. Please, therefore, excuse repetition of much that has been said before, because repetition is necessary to obtain results in the campaign for the prevention of avoidable deafness.

Some ten years ago attempts were made to survey the hearing of school children in a few of the larger schools in New York City. We found that no mass methods were available, and that the individual testing varied so much according to the examiner, or the environment, that our efforts got us nowhere. Some method for group testing was imperative. A brief account of how this was finally brought about may interest you.

Immediately after my return from France in 1919 I became intensely interested in the Piezo electric effect of Rochelle salt crystals, through

*Presented at the Annual Meeting of the New England Otological Society February 28, 1934.

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my neighbor, Mr. Alexander Nicholson, one of the outstanding contributors to submarine detection and allied problems. We endeavored to use the Piezo electric phenomena as a basis for the construction of hearing devices, for hearing by bone conduction, and for a machine for testing the hearing. It turned out that whereas the crystals give purity of tone and less distortion than any other apparatus, they were not so efficient as the best types of telephone transmitter and receiver. A crystal may be used to pick up the vibrations of a phonograph needle and upon my suggestion my friend constructed for me what was intended to be a phonograph audiometer. However, in this machine we abandoned the crystal for the more common methods of reproduction. Our efforts did not achieve a brilliant success, owing to my ignorance of electrical physics and lack of sufficient assistance. Nevertheless we did make a phonograph with graded intensity of sound.

About this time the Research Laboratories of the Bell Telephone Company became interested in constructing a pure tone audiometer utilizing the vacuum tube principle. Knowing of my interest and aims, they invited me to coöperate in designing this instrument, particularly as to the spacing of tones, and the selection of a scale of frequency and of intensity which would be of use clinically. And so were evolved the 1A and the 2A audiometers, the latter because the great cost of the former made it beyond the reach of many otologists.

I determined that the base line for normal hearing should be a straight line because it was simpler and gave a better picture of the graphs than the physicist's curve showing pressures in dynes from minimum audibility. Also by trial it was found that five sensation unit intensity intervals were more practical than the two sensation unit intensity intervals originally proposed, and that the dial could be marked so as to be read off directly instead of indirectly by the aid of tables.

I examined over 100 ears of apparently normal hearing people and selected subjects otologically and apparently otherwise in perfect health. From the hearing sensitivity curves of 82 of these ears the base line representing normal hearing, which is still in use, was determined. It represents the average normal and the lines above and below it represent the average limits of variations above and below normal for the healthy human ear at the various frequencies.

The sensation scale was chosen because it is a logarithmic scale, and the hearing, like other senses, functions logarithmically. An arithmetic scale was inadvisable, among other reasons because it would require too much space; twenty-four sheets of paper for one audiogram to be exact.

The tone emitted at each setting of the audiometer is exactly comparable to the tone of a tuning fork of like frequency sustained at a given intensity. Otherwise stated, at successive diminishing intensity settings, it is comparable to the tone of a fork set in maximum vibration and brought close to the ear at a definite number of seconds intervals so that the loudness changes of the fork may be made to correspond with the intensity difference settings of the audiometer. As a matter of fact, if a tuning fork is accurately calibrated, not only may the loudness intervals be made to appear exactly the same as on the audiometer, but by noting the number of seconds it is heard by a person deficient in hearing, one may transpose the loss in seconds into sensation units (decibels) loss. For instance, I have a 512 tuning fork which dies down almost exactly at the rate of one sensation unit (one decibel) a second. If this fork is struck a maximum blow it generates a sound loudness of the equivalent of 120 decibels above the normal threshold of hearing. Placed very briefly before the ear at five second intervals, it sounds the same as if the 512 D.V. tone of the audiometer is heard through the receiver at a setting beginning at 120 Db. and at each subsequent setting at five units less intensity. Other forks die down at a different number of S. U. a second.

It is not possible quantitatively to measure sound intensity directly. The audiometer measures sound intensity by measuring the electrical energy necessary to produce it. At each frequency the threshold of hearing (the Base Line) represents the minimum amount of energy necessary to produce a sound just audible.

I have gone over this somewhat at length because there still seems to be some confusion as to just how the audiometer works and how it can be compared to the tuning fork. I trust it is now apparent how the same audiogram may be obtained with calibrated tuning forks as well as with the audiometer, although it is a much more tedious job with tuning forks and less accurate because it is impossible to reapply the same intensity with the fork without again activating it.

The audiometer, like the tuning fork, is an instrument not only for testing hearing acuity but for aiding diagnosis. It is imperative, however, to use both the bone conduction receiver and the air conduction receiver to obtain complete data. The great advantage of the audiometer in this respect is that both air conduction and bone conduction losses may be estimated in the same units of measure (the sensation unit, or its equivalent, the decibel). I know of few who seem inclined to do this by the use of tuning forks although I have detailed a method for accomplishing it by calibration, and by using a standard blow of the fork, and placing the prongs of the fork before the ear, and the shank upon the mastoid alternately

every two and a half seconds. This requires quite a leisurely alternation of placements and enables one to note easily by the watch the seconds as they pass. It brings about an approximately even decrement of the fork both by air and bone conduction. It enables one to obtain data by air conduction and bone conduction from one run of a fork, instead of two runs. Of course, several runs must be made and averaged to diminish the amount of probable error.

A word about bone conduction. There is no mystery about the bone conduction receiver of the audiometer. It is simply an oscillator attached by a free rod, through a hollow tube, to a hard rubber foot plate button. This button vibrates up and down exactly as does the shank of a tuning fork. The disadvantage of the fork is that variations in pressure vary the decrement of the fork. That is, they vary the rate at which the sound vibrations die down. They hasten its decreasing loudness. On the other hand, the button of the receiver being attached to the oscillator and therefore having no decrement, may be applied again and again at any desired intensity, and the reading compared with the average normal bone conduction. The average normal for the bone conduction receiver was determined by testing the bone conduction of many normal hearing persons. I know of few otologists who accurately measure air conduction and bone conduction at many frequencies, although failure to do so is often fatal to a correct diagnosis.

After twelve years' use I have become convinced that the audiometer is the most accurate, rapid and satisfactory machine yet devised for testing the hearing. When people say that results do not correspond with tuning fork readings, this usually means that the tuning fork readings were not so accurate as imagined. If one uses the tuning fork, comparing it with one's own hearing as a standard, it means also that one's own hearing may not be so perfect as one imagines it to be. How many have accurately measured their own air conduction and bone conduction throughout the musical scale?

The 1A and 2A audiometers do not help greatly in our group testing problems except from the accuracy standpoint and by furnishing information as to audiometric measurements in general.

The Bell Telephone Laboratories then took up the phonograph audiometer idea, and urged by the Leagues for the Hard of Hearing, eventually produced the 4A (or phonograph) audiometer. This, as you all know, is an instrument for testing groups of forty at one time by calibrated speech, spoken first by a man's voice and second by a woman's voice, numbers being used so that the child listening with the telephone receiver may write them in vertically spaced columns until they become too faint to hear. The space where the child ceases to record the numbers correctly is noted and by the use of a master card the loss of hearing in sensation units is obtained. (With the 4A audiometer there are three sensation units' difference between each speech intensity level.) I take the time to discuss these instruments briefly because I feel that not only otologists but every physician should be cognizant of the best method now available to detect loss of hearing in school children.

The word "deaf" must be used guardedly because it is common to confuse the "deafened" with the "deaf", those who have acquired deafness with those born without hearing. To better qualify the grades of deficient hearing, I am in the habit of grading it as *slight, moderate, marked, very marked, and total* (with possibly before the latter the designation extremely *marked*). This enables one to apportion a difference of twenty sensation units between the different grades, thus:

A loss of not over 20 S. U. would indicate a slight loss.
A loss of over 20 and not over 40 S. U. would indicate a moderate loss.
A loss of over 40 and not over 60 S. U. would indicate a marked loss.
A loss of over 60 and not over 80 S. U. would indicate a very marked loss.
A loss of over 80 would indicate an extremely marked loss.*

I will not go into the reasons for this now because it would consume too much time, but a word may not be amiss as to what is meant when a person's hearing is said to be down 10, 20, 40, etc., sensation units. To make it very simple, it may be well to state it in this way. If you or I are just able to hear a faint whisper 100 feet away in an absolutely quiet place, and someone else cannot hear this whisper unless he approaches to within thirty-three feet from the source of sound, his hearing, compared to ours, is down approximately 10 S. U. (10 decibels). In other words, he can hear the sound only at about one third the distance that you and I have heard the same sound. If another person has to approach to within eleven feet from the sound that we could hear at 100 feet, he is down 20 S. U. (20 decibels). If another person has to approach to about four feet before he can hear the same sound, he is down 30 S. U. If another person has to approach to almost one foot before he can hear the same sound, he is down approximately 40 S. U., etc., etc.

This illustrates what a tremendous difference in hearing distance even a 10 decibel loss means, and how it multiplies with every degree of increasing decibel loss.

What standard should be set up as indicating a loss of hearing? It is not easy to determine this because environment may be such that extraneous noises not only distract the no-

*The word "severe" may be substituted for the word "marked" in the above scheme.

tice of those being tested but, if present, definitely will mask the testing sounds according to their loudness. On the average in a moderately quiet room, one can count on at least a 10 S. U. loss because of these masking noises, and variations in such noises will cause variations and false records of the true hearing acuity. In hospital wards one finds great variations in the masking noises. In the cities, it is difficult to accurately test a normal hearing person in our offices, unless special sound-proofing is used, because the street noises are constantly varying from 40 to 60 decibels above the threshold of audibility. Of course the deafened patient is often not so much disturbed, perhaps not at all. Ever-present noises are one reason why we have fallen into the habit of speaking so loudly that people who have 20 to 30, and even more, degrees of deafness, do not realize they are deafened. Those speaking to them are speaking at an intensity of about 60 decibels to make their voices prevail over the masking sounds. Fortunately the usual masking noises do not interfere with one's hearing the higher testing tones. I mention these facts because they have a direct bearing on testing the hearing and if they are kept in mind the physician will form a better judgment as to the real amount of deafness present.

Over and over again children come to me from the schools claiming no defect in hearing, and their parents are quite indignant because the 4A audiometer tests showed losses in hearing. They often state that their doctor told them the child's hearing was all right. In many instances, losses of 20 S. U. are found, and in many 30 or 40, and even greater losses are actually present, though not apparent to the child or the parents, and not detected by their physician.

One advantage in 4A and 2A audiometer testing is that the receiver being upon the ear, automatically tends to concentrate the attention of the listener on the sounds emanating from it. We are all so in the habit of using telephones that when a receiver is placed upon the ear we intuitively concentrate on the business at hand.

Some have objected to the 4A testing because retests show about one-fourth to one-third of those found deficient in the first test, to be above the minimum standard on the second test. This can never be avoided because, although the audiometer may be checked and rendered stable, the patient cannot be, and hearing variations up to 10 S. U. may be observed in normal individuals due to changing environment, concentration, extraneous noises, barometric pressures, etc. This leads up to the question as to just how much loss in hearing, as shown by 4A tests, should be considered below average normal, and therefore warrant an otological examination. To be conservative and to cut down by half the numbers requiring further examinations, 9 S. U. was chosen as the amount denoting a significant loss. From the standpoint of prevention, it would be far better to use as a standard 6 S. U. loss, because many children with such a loss, and even with normal hearing, have histories of ear disease. In one school I found that out of 361 pupils with history of ear disease but with hearing better than 9 S. U. there were 240 with histories of earache and running ears, and 71 with tinnitus. It is reasonable to suppose that some of these will subsequently suffer from defective hearing. In this school there were 414 without histories of ear trouble with less than a 9 S. U. loss. It is reasonable also to suppose that many of these have had inflammation of the ear and that some of them will go on to deafness, because of past or present, actual or incipient ear troubles, or even independently of them. The same holds true, only more so, for those with positive histories of ear disease. Regular yearly examinations would settle some of these questions and shed light on the prognostic standpoint.

In no division of otologic practice are we so weak as in the criteria for prognosis of deafness. As a rule, we cannot with surety tell a patient who is deafened whether he is going to regain his hearing, whether he may expect it to be improved, whether it will remain stationary, or whether it is going to decrease slowly or rapidly. We can as a rule inform him as to whether he is going to be stone deaf or not, but even the negative of this proposition is not particularly informative or stimulating either for the patient or the physician.

I am aware that some very eminent otologists hold that there is no use in examining children for deafness because those who contract deficient hearing from the diseases of childhood either get well spontaneously or don't and that the treatment has no effect. I cannot subscribe to this defeatist attitude. It is against the experiences of most otologists and it can be definitely shown by repeated careful examinations and audiometric tests that if properly managed, we can benefit over 60 per cent of all children who are sent to us from school surveys, and that lapses in treatment and management are accompanied very frequently by tragic results as to the hearing and also the health. Even if these surveys had not benefited thousands of children, their usefulness from an educational standpoint would have been worth while. They have called attention to the problems of deafness as nothing else has succeeded in doing.

Having an efficient method for the detection of deafness, the next requisite is a satisfactory method of otolaryngological examination on a large scale. I have shown that this can be accomplished by competent physicians working in the schools. If the 2A audiometer charts and

the history cards are prepared in advance by trained teacher technicians, the otologist can easily examine from twelve to fifteen children in an hour, which means that in schools up to 1200 pupils the work in such schools can be consummated in one day*.

If time is pressing the 2A audiometer tests need not be made at all frequencies. As a preliminary run I advocate testing the air conduction and bone conduction at 256, 1024 and 4096 and the air conduction at 8192 cycles. If any of these are found below the average normal, complete audiometric measurements should be made at all frequencies. This small number of frequencies is sufficient as a preliminary test because if the hearing in one of the lower frequencies is deficient, the hearing in the other lower frequencies will also be found deficient. One low tone therefore suffices to detect a loss in the lower part of the scale. I choose as the low tone in this rapid method 256 DV because below this with bone conduction especially, feeling is apt to be confused with hearing. If any of the higher frequencies is found to be down those above or below it may or may not be lowered, and so it is necessary to test the hearing acuity at a greater number of the high frequencies.

Samples taken from large numbers of the population show that there is a gradual diminution in hearing acuity as age progresses. This is, however, not due to age per se, but to the presence of factors harming the mechanisms of the ear. One often runs across the statement that bone conduction is diminished greatly in old age. So it is. So is air conduction if it is accurately and completely measured. Neither A. C. nor B. C. loss is due to old age alone but to definite changes in the conducting or nervous mechanisms of the ear which may or may not accompany old age. Many people approaching 80 have average normal hearing by bone and by air conduction.

There being no question but that the hearing of children on the average is more acute than in middle age, or in the elderly, it follows that our adult standard for average normal is a low normal for children. Therefore, in children even small variations below the standard normal are indicative of trouble, and trouble usually not long past. It cannot be very long past because no year of the child's life is long past.

May I excuse this apparent digression on the ground that it is germane to a better interpretation of the functional tests.

Having before him the child's medical history and the audiograms of air and bone conduction, the duty of the examiner is by otoscopy first with the unaided eye and then with the magnifying pneumatic speculum, to put down exactly what he sees. It would take too long and it would be superfluous before this audience to go into the details of an otoscopic examination. I would like, however, to call attention to one or two points often neglected. The first is that the membrana flaccida should receive as careful attention as the membrana tympani and that the presence and degrees of change of luster, transparency, congestion, bulging, retraction, diminished tension, scars, calcium deposits, perforations, adhesions, and diminished motions, should be recorded.

It has been my habit for many years to denote these by one, two, three or four plus marks, according to the degrees of abnormality, opposite the headings in question; also to note degrees of umbo movability and appearance over the promontory. As any treatment or manipulations savoring of treatment are seldom permitted in school examinations, the question arises: How are we to determine the patency of the Eustachian tube? A simple and positive method for determining the normality of Eustachian tube function is to maintain a slightly lowered air pressure in the external meatus and observe whether the drum membrane thus brought nearer the eye remains stationary while the patient swallows. Of course, the drum should be under constant observation through the magnifying pneumatic speculum.

The reason this test is so informatory is that unless the tube is capable of overcoming the resistance of slight middle ear negative air pressure during the act of swallowing, the tubal mechanism is not functioning normally. This simple test gives us more information than does catheterization and politzerization, both of which inflate the middle ear by means of pneumatic pressures greater than those normally present in the nasopharynx, and both of which, therefore, may prove not that the tube is functioning normally, but simply that air can be blown through it by force. On the other hand many Eustachian tubes may seem blocked when politzerization or catheterization is used for diagnostic purposes, although the drum shows a lack of retraction and balanced air pressures on both its sides, which appearances make it apparent that there can be no pathological blocking of the tube. Another test depends upon the fact that if the drum membrane is easily depressed by meatal air pressure, there certainly is no vacuum in the middle ear, no matter how much the malleus is retracted and no matter how many adhesions exist. If there is no vacuum there can be little blocking of the tube. It is my opinion that politzerization and particular-

*The New York League for the Hard of Hearing has recently trained 250 unemployed teachers obtained through the C. W. A. to make the 4A and 2A tests and take the preliminary histories and do the follow-ups in a survey of about 600,000 children now under way.

ly catheterization is greatly overestimated, overdone, and even, in not a few cases, harmful. In other words, even the best methods have their limitations and should not be used, as is so much the vogue, promiscuously. This is the way I have been talking to the school examiners in New York.

After the otoscopic points of note just given, there is a space on the school chart for "other findings", because in the school examinations we cannot take sufficient space to print all of the possible abnormalities the ear is heir to. It must be remembered that we are examining children who, with few exceptions, are healthy children and without prior knowledge of any hearing defects. Therefore, examinations should be conducted differently than with children who come to us in the usual way for treatment in our offices or our clinics.

Next the school examiner puts down for the right and left sides respectively the presence or the absence of normality or abnormality in the sinuses, as determined by the histories and by rhinoscopy and transillumination, and the presence of normality or hypertrophy of the adenoids, tonsils, pharyngeal lymphoid tissue, etc., also the condition of the nutrition and the health.

The school examiner now having before him all of his data makes his diagnosis and records it by a plus mark or check opposite the proper heading and under either purulent or nonpurulent in each instance. You will notice that the word "catarrh" is omitted from the diagnosis of the middle ear diseases, and that we have included in the diagnostic scheme the term "past masked inflammation". I have used this nomenclature for diagnosis many years and it has served my purposes well. I realize that it is a variation from the normal practice but I feel it is clinically more satisfactory and accurate than the usual schemes using the word "catarrh" for the nonpurulent middle ear diseases. You will note that other diseases of the ear are covered by the title "complications". This scheme has proved to be quite sufficient for the school examinations but, of course, it might not be advisable for clinic cards. On the right hand side of the picture under the heading "Advice" are the three degrees of urgency for treatment—"Immediate attention," "Within a month," "Later" (advisable aside from the urgency standpoint, to bring about an even distribution load) and below this, "Advice as to the necessity for front seat in class," "A hearing aid," "Lip reading," "Speech training," "Special school," "Medical treatment," "Otolaryngological treatment," "Operations." The examiner then signs the card and it is sent to the private physician or the clinic where the child is to report for treatment.

Across the bottom of the history card you will see a space arranged for this follow-up examination. If the outside examiner agrees with the school examiner, he simply checks the latter's statement and no further remarks are necessary, otherwise he states wherein his observations disagree with the school examiner's and puts down his diagnosis and his advice as to treatment and care. By this arrangement, each examiner is made aware that another otologist will examine, or has examined, the case, so that each should be impelled to be more meticulous as to observations and advice.

It is the outside otologist who must administer treatment, and here is where the chief difficulty is going to arise, because we all know that except for the surgical cases, the great majority of patients applying for otological care might just as well and often better stay at home. After a sketchy examination, or often merely a look, and seldom with a careful hearing test, they receive irregular and often unsatisfactory middle ear inflations and possibly a squirt of some solution into the nose, maybe oil drops to use at home, or some type of silver nasal pack. All of these may have their proper indications, but, as used for clinic patients, are apt to be of little aid, are great wasters of time both for patient and doctor, and are even frequently harmful.

The American Federation for the Hard of Hearing and the various Leagues have been of inestimable service in spreading the gospel of Preventive Otology. May I urge the otologists and the whole medical profession to back them up and join them in the work for Hearing Conservation.

I feel that the program we are now launching in New York City will be of some educational vaue not only to the otologists and the school authorities, but to the patients and their parents and friends, and to the profession at large. This is about all we hope for at this time because it will take years of effort to accomplish anywhere near the ideal service for the potentially or actually deafened child.

A SIMPLIFIED CONCEPT OF ARTHRITIS

BY H. K. THOMPSON, M.D.*

THOSE particularly devoted to the subject of arthritis experience pleasure in the increasing interest on the part of the profession at large, and enjoy the process of crystallization which more concentrated effort makes possible. It is only within the last few years that ancient prejudice against the subject and a general attitude of hopelessness are beginning to be eliminated. The profession once aroused has discarded the single track approach to the subject, has begun to awaken public interest in possibilities of combined and generalized treatment, and has already made great strides toward the unifying of nomenclature and case conduct.

Out of the complexities there may appear a compact and fairly defined concept embracing the whole as a total of orderly contributing elements. In considering such a concept we are mindful that no two individuals react in the same way, every case has its own laws and government and there is nothing immutable in all medicine. By placing generalities in groups, however, and reducing the elements to formulae, we may be able more clearly to visualize values as applied to cases.

In making such an attempt let us use certain letters of the alphabet to represent graphically the outstanding factors which go to make up the activating or precipitating elements in arthritis. The following table will include the more salient elements:

Let A	represent	Allergy or Allergies.
B	"	Bacteria.
C	"	Climate, unfavorable.
D	"	Diet, inadequacies.
E	"	Endocrine, imbalance.
F	"	Fatigue, physical or nervous.
G	"	Gastro-Intestinal Disturbance.
N	"	Nerve Systems.
T	"	Trauma, acute or chronic.

Consideration of each or many of these factors together occupies us in the adequate summary and evaluation of a case. Attention to too few of these factors accounts for many failures in treatment.

But these are not all. There is always the unknown factor, the soil. We may designate this by the letter X, and understand by it those basal factors such as are encompassed by the term heredity,—natural immunity, and anatomical type. They are the immeasurables, but present in everyone. They alone may be powerful enough to withstand the whole alphabet of factors; in which case there is no arthritis. X, therefore, must be included in the evaluation of every case.

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An example may be simply expressed as a graphic formula:

Mrs. Y. a charwoman, aged 48, has had pain in the knees, worse after menopause, gaining excessively in weight, and has lately been under severe nervous strain born of domestic and economic struggles. She is found to have poor and infected teeth. Let this composite be expressed as follows:

$$\text{Patient} = X\ (B+E+N+T)$$

Let other letters be added as found 2B may indicate two foci, or there may be more. Besides the traumatic factor of working much on her knees, there may be other physical strain, perhaps postural. The element of strain may be outstanding in the case. We may then express this factor as squared (T_2). In the event that the whole picture seems quite acute or severe we may square the whole sum of the involved quantities, such as:

$$\text{Patient} = X\ (2B+E+N+T)_2$$

The possibilities of indicating roughly the components of a given case in this way are at once apparent, while it is also a guide to the direction in which treatment should be aimed. The treatment of the case is aimed at the elimination of as many as possible of the known elements. It may be that when sufficient load has been removed there will be relief from symptoms even though there remain other causes. As an instance of this, climate, which is often inescapable and yet may be the deciding factor in an intractable case.

The number of letters or symbols suggested is arbitrary and is intended entirely for individual interpretation. Obviously we should not all evaluate a case in absolutely the same way any more than our methods of treatment would be identical. However, the outstanding considerations would be the same, and it would be helpful in the final grouping of cases.

While this concept in no way interferes with the various terminologies of diagnosis in use, it will be found simpler to embrace that accepted and agreed upon more universally at this time; (1) Rheumatoid Arthritis. (Atrophic Proliferative, etc.) (2) Osteoarthritis (Hypertrophic, Degenerative, etc.) And as a further designation of type, use subheadings as one is so disposed, for instance:

Specific Arthritis
- Luetic
- Tuberculous, etc.

Non Specific Arthritis
- Rheumatoid Arthritis
  - Infectious
  - Atrophic (generalized decalcification)
  - Toxic, etc.

Osteoarthritis
Traumatic
Senile, etc.

As many of these merge so nearly and occur in so many combinations, they are difficult at best to appraise. The use of subheadings for type-distinction offers the simplest possibility of individual interpretation, while holding to main group-divisions in a standard and acceptable way.

The obvious objection to the Atrophic-Hypertrophic classification lately in vogue is the fact that cases of the infectious type under the former caption are not those of the generalized bone atrophy type, and are not, for the most part, atrophic at all.

RESTORATION OF AUTOPSIED BODIES*

A Better Method

BY HAROLD W. WILLIAMS, M.D.,† AND DONALD G. HENDERSON, M.D.†

IN an effort to reduce the criticism that embalmers have voiced in preparing autopsied bodies, a method whereby the embalmer is actually helped has been used in the Taunton State Hospital for over two years. Not only have embalmers been pleased with the method, but they have helped obtain autopsy permission when their advice has been asked by relatives. The method offers a rapid procedure for injection of the usual vessels. There is no room for the complaint that the vessels which were cut at autopsy were not repaired, as with this method the arch of the aorta is left intact or can be removed, and the individual branches arising from it can be utilized with only slight changes in technique. The purpose of this method is to connect the arterial system so that it is easily accessible from the surface of the autopsied body.

The autopsy proceeds in the usual manner, except that care is taken in removing the heart to cut the ascending aorta close to the aortic valve, leaving the aortic arch intact. After all the other organs have been removed the descending aorta is sectioned transversely at about the level of the fourth dorsal vertebra, and the abdominal portion of the vessel is sectioned transversely about 4 cm. above the bifurcation into the common iliacs. The ascending aorta is tied tightly with heavy tape. An 18 mm. (outside measurements) glass cannula with bent stem is inserted into the descending portion and tied tightly in place. A similar cannula about 10 mm. (outside measurements) is tied into the stump of the abdominal aorta above its bifurcation. Rubber tubing is attached to the stem of each cannula, and brought outside the body. We now have outside access to the arterial system of both the upper and lower portions of the body.

In those cases in which the arch of the aorta is removed for examination, the innominate artery, left common carotid and left subclavian arteries are cut as close to the arch of the aorta as possible. A smaller sized cannula is tied into the innominate artery and a "Y" tube tied into the common carotid and subclavian arteries. Rubber tubing is attached to each cannula and brought up to the surface of the finished body.

In the female the rectum and vagina are tied to prevent spilling of the embalming fluid that returns to the abdominal cavity by the venous return flow. Strips of cellucotton are placed in the thoracic and abdominal cavities and a wad is forced into the pelvic cavity. The body is then closed, and the rubber tubes from the cannulae are brought to the surface of the body.

The calvarium is removed in the usual manner with the exception that the anterior and posterior incisions are carried about one inch beyond the point of junction on either side. After the brain has been removed, the internal carotid arteries are tied and the base of the skull filled with quick-setting plaster of Paris. The calvarium is then filled with absorbent material and firmly secured in place by means of tape which passes from the junction of the saw cuts over the top of the calvarium where it is tied. This method of securing the calvarium has proved itself to be very satisfactory. Slipping is prevented, and oozing is no longer a problem.

The embalmer injects his fluid through the rubber tubes which project from the body in the epigastric region, and after the desired result has been obtained, he needs only to tie off these tubes, and his work is completed.

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VERMONT STATE MEDICAL SOCIETY

MISCELLANY

VERMONT DEPARTMENT OF PUBLIC HEALTH

JUNE, 1934

The incidence of communicable diseases reported during the month of June is as follows: chicken pox 156, diphtheria 8, measles 149, mumps 79, scarlet fever 75, undulant fever 2, tuberculosis 8, whooping cough 60.

The Laboratory of Hygiene reports a total of 1,830 examinations made during the month of June, classified in the following manner:

Examinations for diphtheria bacilli	80
" " Widal reaction of typhoid fever	40
" " undulant fever	46
" " gonococci in pus	103
" " tubercle bacilli	231
" " syphilis	462
" of water, chemical and bacteriological	166
" " water, bacteriological	278
" " milk, market	208
" " milk, submitted for chemical only	6
" " milk, submitted for microscopical only	146
" " foods	0
" " drugs	0
" for courts, autopsies	5
" " courts, miscellaneous	9
" of animal heads for evidence of rabies	0
" miscellaneous	49
Autopsies to complete death returns	1

Seventeen cases of gonorrhea and twenty-one cases of syphilis were reported to the Division of Communicable Diseases. Seven hundred and eighty-nine Wassermann outfits and 478 gonorrheal slides were sent out by this Division.

Two hundred and eighty-seven patients were seen by the nurses of the Poliomyelitis After-Care Division, 100 at their homes and 187 at clinics. Ten pieces of apparatus were fitted and 42 orthopedic corrections made to shoes. The spring clinics were held at eight centers, with a total of 185 patients in attendance. The vocational worker of this Division reports sales made amounting to $49.58 for the month of June.

The State Advisory Nurses visited twelve towns of the state, attending P. T. A. meetings and assisting with preschool clinics.

RECENT DEATHS

SKEELS—ALBEE A. SKEELS, M.D., St. Albans, died at his home on June 20, 1934. He was born in 1873 and received his medical degree from the McGill University Faculty of Medicine in 1897. The honorary bearers at the military funeral were prominent St. Albans citizens, while the active bearers were all Canadian Veterans. A delegation from the United States Army attended the funeral. The service at the grave was military also. A firing squad from Company H fired a salute as the casket was being lowered. The last post and taps were sounded by local buglers. Dr. Skeels is survived by his widow.

START—SIMEON G. START, M.D., Cambridge, died after a brief illness at the Fanny Allen Hospital in Winooski, June 20, 1934. He was the son of Judge Henry R. and Ellen Houghton Start of Bakersfield, where he spent his boyhood and graduated from Brigham Academy in 1889. His medical training was taken at Bellevue Hospital Medical College in New York City where he received his degree in 1895.

After practicing a short time in Richmond and Sheldon he went to Cambridge in 1897 where he practiced medicine for thirty-six years with the exception of one year when he served as captain in the U. S. Medical Reserve Corps.

In 1898 he married Nettie A. Ellinwood of Cambridge who died in 1929. In 1931 he married Helen L. Denning of Burlington who survives him. He is also survived by his daughter, Edith Barlow, who now lives in Chicago, Illinois.

Dr. Start will always be remembered as a loyal servant to his community and his record as a country physician is both enviable and esteemed by his colleagues and many friends.

A STUDY BY LEMUEL SHATTUCK ON THE VITAL STATISTICS OF BOSTON 1811-1839

Shattuck shows that the crude death rate for the period 1826-1835 was over 21 per 1,000 population. For the years 1929-1931, the death rate of Boston was about 14 per 1,000, or a third less than it was a century ago. These figures are informative, but they fail to tell the whole story. The age distribution of the population in 1830 was far more conducive to a low death rate than is that of to-day. Less than 16 per cent of the population were over 40 years of age, whereas to-day, about 33 per cent are so classified. Fully 70 per cent of the inhabitants in 1830 were under age 30, while only 51 per cent of the present population are in this category. If there had been as large a proportion of old people in the population of Boston a hundred years ago as there is to-day, the crude death rate would have been even higher, 24.0 per 1,000 instead of 21.0 as reported.

With so high a mortality, the expectation of life at birth did not exceed 38 years. Since expectation of life in Boston to-day is approximately 55 years, there has been a gain of 17 years or 45 per cent in the expectation of life during the last century.

This increase in the expectation of life has not been attained solely through a saving of the lives of infants and young children, but has extended to ages up to 60 years.—*Bulletin, Metropolitan Life Insurance Company.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.

CASE 20341

PRESENTATION OF CASE

A sixty year old American salesman was admitted through the Emergency Ward complaining of paroxysmal unproductive cough of four months' duration.

Approximately two years before admission the patient had a cold followed by a dry irritating cough. The cough cleared up after he stopped smoking. About four and a half months before admission he again had a cold followed by dry hacking cough associated occasionally with whitish sputum. He stopped smoking, but this did not relieve the cough. Six weeks before admission the cough became harsh and paroxysmal in character. Two weeks later he noticed that his face was puffy, more so in the morning. He found it necessary to get a larger neck band. This condition gradually became more severe. A week before admission, after a severe attack of coughing, he became unconscious and fell. After this he fainted two or three times after severe coughing. There had been no loss of weight or strength. He had worked off and on until four days before entry. His work consisted in sorting leather in a shoe factory. During the present illness his vision had failed very slightly. He had no diplopia. His voice had become a little husky. During the past three nights he had become orthopneic.

His family and marital histories were noncontributory.

He had always been strong and healthy. There was no history of typhoid fever, rheumatic fever, malaria or pneumonia.

Physical examination showed a well-developed and nourished man weighing approximately 290 pounds. He was sitting up in bed coughing. The cough was of a severe, spasmodic, brassy character. The sclerae showed moderate injection. There was marked swelling of the neck, more marked on the left, where it extended up to the face. The left supraclavicular space was diminished. The neck and arm veins were congested. When the arms were raised the veins collapsed slowly. The lower left cervical and supraclavicular glands were discrete and firm. There were a few small palpable axillary and inguinal glands. Examination of the chest showed inconstant râles at the left apex anteriorly and bronchial breathing and egophony posteriorly in the midline at the level of the upper borders of both scapulae. The supracardiac dullness measured 10.5 centimeters. This area of dullness extended from the level of the first to the fifth ribs. There was no pulsation over the supracardiac region or above the sternum. The blood pressure in the right arm was 135/90, in the left 95/65. The prostate was slightly enlarged but not firm.

The temperature was 98°, the pulse 90, the respirations 20.

Examination of the urine was negative. The blood showed a red cell count of 4,700,000, with a hemoglobin of 80 per cent and a white cell count of 14,350 with 86 per cent polymorphonuclears. The smear was negative. The platelets were normal. The stools were negative. A Hinton test was negative.

X-ray examination of the chest showed obliteration of the costophrenic angles. Both diaphragms were straight. There was bilateral axillary pleural thickening. The right interlobar septum was visible and displaced downward. Both diaphragms showed slight impairment of motion. The right lung field was somewhat less radiant than the left. The whole mediastinum was grossly deformed. The trachea and esophagus were displaced posteriorly to the left by a 10 centimeter soft tissue mass. This mass was slightly lobulated and did not pulsate. In the lateral view there appeared to be a small amount of lung tissue between the mass and the sternum. Posteriorly the mass extended to within one or two centimeters of the spine.

Two days after entry it was discovered that the patient had received x-ray treatment over his chest for twenty-five minutes two days before entry. This treatment was probably from a low voltage machine. He was given x-ray treatment here on the second day with no immediate untoward effects. He had started to fail before the treatment was given. On the following morning his radial pulse could not be felt, he became increasingly cyanotic, the temperature rose to 100°, his heart rate to 150, the respirations to 27, and he died.

X-RAY INTERPRETATION

DR. AUBREY O. HAMPTON: The description is quite complete except that the lobulation is questionable. This side is certainly straight and smooth. There may be some lobulation here. The arch of the aorta is clearly seen through the mass. This is the descending portion. The esophagus is in the normal position in the anteroposterior view, so we can say fairly definitely that there is no aneurysm in the arch of the aorta. The ascending portion of the aorta is not seen at all. An aneurysm of that size should displace the esophagus to the left. There is fluid

at the bases and either a thin layer of fluid or thickened pleura along both axillary lines.

In this lateral view the sternal notch is here, and there is air up to the manubrium, apparently in front of the mass. Ordinarily when we have just this film we think of thymoma first because it is smooth, with very little lobulation, symmetrical on each side, and with no displacement of the heart and trachea. When the mass does not lie against the sternum we question it, and yet we know that thymomas may lie posteriorly on the heart. We made a diagnosis of thymoma and we quibbled over what that meant—whether or not it meant Hodgkin's disease or some other type of tumor.

DR. GERALD BLAKE: Did that picture show compression of the trachea?

DR. HAMPTON: I am not sure it is compressed. It fades out here below the mass but there is not sufficient exposure on the film.

DIFFERENTIAL DIAGNOSIS

DR. MYLES P. BAKER: The problem here is to hazard a diagnosis on a mediastinal mass which has apparently given rise to very little pulmonary atelectasis. Very often these cases come into the ward and show physical signs and x-rays similar to those of this mediastinal mass and they are referred to the X-Ray Department for question of treatment. If the mass decreases in size after x-ray treatment one thinks that the diagnosis is probably lymphoma and not carcinoma, and one is not much the wiser for it.

I am going to say that I think this man probably has bronchiogenic carcinoma that has spread to the mediastinal lymph nodes. What evidence have we for that? He is a man of sixty, certainly in the cancer age. It is a matter of fact that males more frequently have bronchiogenic carcinoma than females. We cannot lay much stress on the irritating cough two years previous to admission. These bronchiogenic carcinomas have a notoriously long duration and patients may have symptoms of nonspecific chronic bronchitis for years. We know of cases that have gone for seven years. For the past four and a half months, however, this patient has had the typical dry hacking cough, the paroxysmal cough of bronchiogenic malignancy. He has not had hemoptysis, which suggests that he has no ulceration of the bronchial mucous membrane. Perhaps we are dealing with a tumor that involves predominantly the mediastinal lymph nodes rather than developing extensively at the small primary focus in the bronchial mucous membrane.

His symptoms and signs when he was examined in the ward are characteristic of a compression of the great veins, leading to the edema of the face. The anoxemia is incapacitating sometimes when he leans over. He has cough and attacks of faintness. It is the picture one occasionally sees with aneurysm of the aorta, and not that of the slowly progressing vena cava obstruction that Osler described with mediastinal tuberculosis, with establishment of collateral circulation, that MacCallum has shown in his textbook.

The patient weighed 290 pounds on admission. He may have lost weight without knowing it. He has not been incapacitated for work. He has been able to work until shortly before admission. This is not uncommon in bronchiogenic carcinoma. Very often the patient is a fairly well preserved person who comes in with a rapid terminal picture, with these symptoms and signs. The firm left cervical and supraclavicular glands are consistent with such a diagnosis. They very frequently extend up to the supraclavicular glands and down to the retroperitoneal glands. I have seen a case of bronchiogenic carcinoma with the same sort of edema of the left arm. I remember it particularly well, because we finally prevailed on the patient to undergo bronchoscopy and just before the operation the surgeon felt this mass in the region of the anterior left cervical glands, refused to bronchoscope, and advised biopsy of the "gland". We had not been aware of enlarged glands and we were put out about it; we felt a little more closely and found it was external jugular vein thrombosis. This might have happened in this case. These tumors are apt not only to press on the superior vena cava, the innominate vein, but actually invade the wall and increase the obstruction such as we see this man had in his left subclavian vein, around the left subclavian artery. So far as we know, he has not had fever. That not infrequently is associated with bronchiogenic carcinoma, but after all he has not the atelectasis, the actual endobronchial obstruction that so often leads to bronchiectasis and lung abscess.

The laboratory work does not help us. The fact that he has no anemia in this one count may not be reliable evidence. The leukocytosis is consistent with a bronchiogenic carcinoma. Tumors often break down and become necrotic and hemorrhagic. The negative Hinton is interesting, because in cases of aneurysm we should get a positive Wassermann in over 80 per cent.

The x-rays show that the mass does not implicate the aorta. The fact that he has fluid at the bases is much more consistent with tumor than aneurysm.

What else can we consider a possibility in diagnosis? Hodgkin's disease limited, except for the supraclavicular glands, to the mediastinum is well known. The supraclavicular gland I judge is considered too firm for Hodgkin's. Thymoma and lymphosarcoma I know little about. I have an impression that lymphosarcoma responds very well to x-ray therapy and that perhaps this man's mass is a little too clearly out-

lined in the x-ray films for lymphosarcoma. So far as I know the pathologist's diagnosis of thymoma is conclusive. I do not believe we can make that diagnosis clinically. The diagnosis is frequently made of mediastinal sarcoma, but more and more, as I understand it, these small round cell sarcomas of the mediastinum are being established as so-called oat-cell tumors originating from small tumors in the basal layer of the bronchial mucosa and spreading to the mediastinal lymph glands to replace them and cause this picture of mediastinal mass.

Clinical Discussion

Dr. Gerald Blake: Our immediate problem in this man was not so much the question of differential diagnosis as trying to give him some treatment that would allow him to continue to breathe before the process obstructed the trachea completely. Knowing that he had had some radiation we naturally wondered if the reaction to the radiation was a feature in the extreme dyspnea that he showed. It made us all the more wary of a large dose of x-ray, which was the only thing we had to offer him here. Tracheotomy alone did not seem to offer a solution of this problem. It was suggested that a tracheotomy be done and some sort of tube put down to extend beyond the point where this mass compressed the trachea; but that was decided to be impracticable. He was sent to x-ray with the advice that the x-ray be given as before, without giving enough to produce edema of the remaining mucous membrane of the trachea. Our impression was that lymphoma was the most probable and favorable diagnosis, but we could not rule out carcinoma. The x-ray treatment did not affect the mucous membrane sufficiently to precipitate edema.

Dr. Edward D. Churchill: There is one procedure that should be thought of in a case of upper mediastinal compression of this type and that is the splitting of the sternum before embarking on deep x-ray therapy. It can be done under local anesthesia, simply splitting the sternum down to the third interspace, allowing the two edges to stand apart to give more room in the superior thoracic strait. I do not know whether it would have been feasible in this case or not. It is of no avail in the face of infiltrating carcinoma that is gripping the trachea and the esophagus. In lymphoma or thymic tumors which project into the thoracic strait and cause obstruction primarily from compression I think considerable relief of dyspnea could be accomplished and x-ray therapy be made safer. In one type of plunging goiter I think it ought to be considered, particularly in a very fat necked individual.

Dr. Walter Bauer: I should like to ask Dr. Hampton if thymoma does not respond very well to x-ray therapy.

Dr. Hampton: The ones we are accustomed to see do. We have had one that was called thymoma pathologically that did not. I think most of our thymomas are lymphomas. The ones that we have treated certainly responded, except one. I should like to say that I have never seen a lymphoma gland enlarge after radiation, I mean one that could really be measured. I have seen them go down within twelve hours.

Clinical Diagnosis

Mediastinal tumor, lymphoma.

Anatomic Diagnoses

Lymphoblastoma, sarcomatous type, of the thymus with involvement of the tracheal and bronchial glands.
Tracheal obstruction, extrinsic.
Hydrothorax, bilateral.

Pathologic Discussion

Dr. Tracy B. Mallory: I think a differential diagnosis beyond the point of mediastinal tumor is quite impossible in this case. We found an enormous mass lying almost entirely in the region of the thymus. There had been some extension down into the bronchial and up into the cervical lymph nodes. The tumor completely surrounded the superior vena cava and definitely narrowed it. It was not very obvious from postmortem whether there was more compression on the left side than on the right. It was the common vena cava that showed the most marked degree of narrowing and one would have supposed the obstruction would have been equal in the two arms. The trachea was surrounded by the mass on three sides; on the posterior surface it was free and the esophagus was uninvolved.

Histologically the tumor seems to be a pretty typical lymphosarcoma. The question comes up as to whether it should or should not be called a thymoma. The thymus contains a small number of epithelial cells which make up the Hassall's corpuscles and from these cells epidermoid carcinomas can develop as a primary tumor of the thymus. The remainder of the thymic tissue looks on microscopic examination with any known stain like lymphoid tissue and the cells in it are generally supposed to be lymphocytes, but there is some disagreement on that point. We have had one case here of a primary non-epithelial tumor of the thymus where I felt quite certain that the cells were not lymphocytes, though I could not say what they were. Similar tumors have been described before in the thymus and certainly deserve at the present time to be called thymomas. I should say that here we were dealing with a lymphosarcoma primary in the thymus and beginning to extend to the regional lymph nodes, but not

as yet generalized throughout the lymphoid tissue of the body.

The autopsy was limited to a chest incision so we were not able to make a very adequate exploration of the abdomen. The spleen and liver were not enlarged and there were no palpable mesenteric glands.

CASE 20342

Presentation of Case

A sixty-four year old American housewife entered through the Emergency Ward.

Two years before admission she had gradual onset of constipation associated with periods of cramp-like pain in the midabdomen lasting four or five days at a time but not accompanied by vomiting. The constipation necessitated the daily use of salts. One year before admission the abdominal cramps came on more frequently and the constipation became more severe. The salts were no longer effective and seemed to upset her stomach. By taking one teaspoonful of castor oil daily and frequent enemas she managed to have a bowel movement every two or three days. The attacks of pain now came every three or four days. Two weeks before admission she had intense, colicky, cramp-like pains starting in the region of the umbilicus and moving back and forth across the abdomen. The abdomen became very greatly distended. She had eructations of large amounts of gas. The pain kept her awake at night. She had lost her appetite, and following an attempt to eat became nauseated. She induced vomiting with her finger. She had no spontaneous vomiting. Her stools had been formed. There had been no diarrhea and no bloody or tarry stools.

One year before admission she came to the Outpatient Department. A barium enema showed diverticulitis of the sigmoid. A gastrointestinal series was reported as negative. She was placed on a régime of mineral oil, frequent enemas and a low residue diet.

Four weeks before admission she again returned to the Outpatient Department complaining of gas pains in the midabdomen. She was seen three different times in the medical clinic. At the second visit she complained of colic in the left lower abdomen. A diagnosis of dietary indiscretion, obesity and nervousness was made.

Two days before admission she came to the Diagnostic Clinic, having been referred there by another doctor whom she had consulted. No diagnosis was made, but another barium enema was advised. This was taken. In the x-ray room she collapsed and was sent to the emergency ward.

The past history was non-contributory.

Physical examination showed a well-preserved elderly woman apparently suffering mild pain in the abdomen every three or four minutes. The abdomen was greatly distended. In the right lower quadrant a distended loop of gut which was very tense with gas appeared to be present. This collapsed with a gurgling noise after firm palpation. Simultaneous with her pains hyperactive peristalsis was heard. No abdominal or rectal masses were made out. Except for dental caries, senile vaginitis and atrophy of the uterus, the physical examination was not remarkable.

Examination of the blood showed a white cell count of 10,000. The urine was negative. No stool examination was made prior to operation.

Two days after admission she was operated upon. Her convalescence up to the present time has been uneventful.

X-Ray Interpretation

Dr. Aubrey O. Hampton: This is a film of the last barium enema. She quite obviously had diverticula in the sigmoid and descending colon without evidence of obstruction in the colon. Although there is a great deal of spasm along the sigmoid, there is no evidence of perforation, inasmuch as no track of barium may be seen running into the soft tissues. We have demonstrated perforated diverticula by running the barium into the abscess, but no such finding is here. She had also this definitely dilated and distended loop of small bowel which has the haustrations of the colon; but we know it is not the colon and therefore suspect that it is the terminal ileum.

Differential Diagnosis

Dr. Robert R. Linton: As I went over this case the following things seemed important. First of all we have a sixty-four year old woman who began to have trouble with her bowels two years before she came in. Reading through the story in a consecutive manner one comes to the conclusion that she has had increasing obstipation over a period of two years until the time she came in, when she had complete obstipation. Going back a year in her history, she was seen in the Outpatient Department where a barium enema showed diverticulitis. It is quite possible that the diverticulitis was sufficient reason for the obstipation at that time. She also had a negative gastrointestinal series, indicating that there was no organic obstruction one year before entry.

Four weeks before entry she was seen again, complaining chiefly of gas pains in the midabdomen. Two weeks before entry she had very intense colicky pains starting in the region of the umbilicus and moving back and forth across the abdomen. I think that was about the time when she began to have complete obstruction. Two days before admission she was seen in the Diagnostic Clinic and nothing of moment was disclosed at that visit.

The x-ray examination helps to rule out the thought that first came to my mind, carcinoma of the colon. It is stated that she did not have any blood in her stools, but it might have been that she did not notice it. However, from the film there is no evidence of organic obstruction. X-ray examination did show some loops of intestine that were tremendously dilated and full of gas. These were even noted on physical examination at her last admission, chiefly in the right lower quadrant where one specific loop could be felt; it would appear and disappear on palpation of her abdomen.

It seems to me without any question that this patient had an obstruction which was lying in the ileum, most likely in the lower ileum. I doubt very much that it was malignancy. Malignancy of the small bowel is very rare. It does occur, however, but I should rather vote against it.

As to the other possibilities, a good deal has been said about regional ileitis in the past year or so. I am not very well acquainted with the disease, but I do not think this case falls in that group because the patient had obstipation rather than prolonged diarrhea. I do not think her diverticulitis had anything to do with the obstruction. It is possible that she had a Meckel's diverticulum which had become bound down and in some way a loop of bowel got twisted around it. The white cell count was only ten thousand. That is against any strangulation of the bowel due to an adherent Meckel's diverticulum or mesenteric defect, with herniation of the bowel through it. Appendicitis might be considered. I do not think appendicitis itself would cause obstruction, but a loop of small bowel might become adherent to an inflammatory mass and so produce a kinking of the bowel at that point. There is still one other condition that might be considered. I do not believe a diagnosis could be made, and the x-ray is rather against it; that is, there might be a gall stone impacted in the ileum. I should rather expect that to show up by x-ray. It is usually a large solitary stone containing calcium which will cast a shadow on the x-ray film.

In conclusion I do not think I can make a specific diagnosis, except that the patient had small bowel obstruction, most likely in the ileum, and not due to malignant disease.

Clinical Discussion

Dr. Tracy B. Mallory: Dr. Vincent, you saw the operation. Will you tell us about it?

Dr. Beth Vincent: Even though I saw Dr. Faxon do the operation I cannot add very much to Dr. Linton's discussion. The principal factor of the case is that we could make a diagnosis of intestinal obstruction when she was first seen. It seemed as though the obstruction was subacute, that it would be safe to send her to the ward to wait a day or two for study and preparation for operation.

In view of the x-rays our first diagnosis was small bowel obstruction from diverticulitis, produced by an adherent loop, a condition that is quite often met with in diverticulitis. The patient's age brought up the question of malignancy. The x-ray of the large bowel seemed to rule out the fact that the malignancy would be at that point. The condition of the patient precluded the investigation of the small bowel by x-ray for malignancy. It was not advisable to fill the upper part of the intestinal tract with barium under these circumstances.

On the second day in the ward the patient was more comfortable, although she was still having some pain. Her condition was improved somewhat by liquid intake and by enemas, but it was evident that she was having periodic attacks of obstruction pain. From the surgical point of view it was equally evident that it was not safe to wait longer and Dr. Faxon went ahead with the operation.

Shall I give the operative notes?

Dr. Mallory: Yes.

Dr. Vincent: He made a low abdominal incision and found obstruction, as Dr. Linton suggested, in the ileum. A loop of the ileum was obstructed by being adherent to its mesentery. It was evident that dividing the adhesions would not relieve the obstruction. There was a mass in the mesentery. This mass did not seem to spring from the mucous membrane in the bowel. Considering the fact that the obstruction could not be sufficiently relieved by dividing the adhesions, and though the mass was thought to be inflammatory rather than malignant, it seemed wise to remove it by resection. He resected the ileum and did a side-to-side anastomosis. At that time we thought that the diagnosis was some inflammatory lesion in the mesentery of the ileum causing secondary obstruction.

Clinical Diagnosis

Carcinoid of the small intestine.

Pathologic Discussion

Dr. Mallory: The lesion found in the small intestine was a very unusual one, but very characteristic. If one has ever seen an example, I think he would recognize it the second time very readily. There was in the submucosa a disc-like area—a little larger than a dime—of thickening and infiltration. In the eight cases that I have seen, the submucosal lesions have been almost alike. Just at the mesenteric border was a relatively large tumor nodule which was causing the obstruction. The involvement of the mucosa was so slight that it in itself caused no obstruction at all, but the secondary

tumor masses that are characteristically found quite frequently do cause obstruction. From the gross appearance and the microscopic examination on the frozen section we were able to make a positive diagnosis. It was typical of the so-called carcinoid of the small intestine, similar to the carcinoids frequently found in appendices.

Histologically the tumors look at first glance like basal cell carcinomas. Masson, in a long elaborate series of studies, has been able to prove that these tumors arise from nerve end organs in the intestinal tract. There are cells normally present in the mucosa of the small intestine and of the appendix which are essentially nerve end organs and from these develop these tumors which look so much like epithelial tumors that for a long time they have been called carcinoids. In the appendix they are almost uniformly benign. In the small intestine they are of some degree of malignancy. They almost invariably show some invasion, but the grade of malignancy is probably a relatively slight one. We had an interesting chance to check that point a year ago when we autopsied a patient who died of some intercurrent disease, such as lobar pneumonia. She had been operated upon by Dr. Daniel F. Jones sixteen or seventeen years previously for small intestinal obstruction and tumor. At autopsy we found a lymph node in the mesentery containing tumor, showing that metastases had been present for seventeen years and in no way influenced the patient's health; so one must regard them as potentially malignant and capable of metastasizing, but of a low grade of malignancy. The prognosis after complete removal is good, though I have seen generalized metastases in one instance.

The New England
Journal of Medicine

SUCCESSOR TO

THE BOSTON MEDICAL AND SURGICAL JOURNAL

Established in 1828

Published by THE MASSACHUSETTS MEDICAL SOCIETY under the jurisdiction of the

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, Canada $7.04 per year, $8.52 per year for all foreign countries belonging to the Postal Union.*

Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the Journal office, 8 The Fenway.

The Journal does not hold itself responsible for statements made by any contributor.

Communications should be addressed to The New England Journal of Medicine, 8 The Fenway, Boston, Mass.

STERILIZATION AND ITS POSSIBLE ACCOMPLISHMENTS

AT the International Congress of Anthropological and Ethnological Societies recently held in London, England, the problems of sterilization of human beings occupied a prominent position in the discussions.

Dr. C. C. Hurst of Cambridge University, England made an important contribution to this subject. From an historical attitude he showed that the "idea is as old as Plato", and was advocated anew by Francis Galton of England about fifty years ago.

Indiana legalized eugenic sterilization twenty-seven years ago, and was the first of the states of this Union to do so. Twenty-six other states have enacted laws relating to sterilization, but California, Virginia and Michigan, only, have applied sterilization on a large scale.

Germany is perhaps the most progressive nation in restricting fecundity among the unfit, for that country provides that the treatment is compulsory when ordered by district courts, which consist of a judge, an official medical officer of health, and another doctor who is a recognized expert in hereditary diseases.

It has been estimated that at least 400,000 persons will be subject to court action for a decision as to the wisdom of sterilization. In the German act, eight groups of diseases are scheduled as hereditary, and therefore warranting sterilization.

Five are mental defects such as innate mental deficiency, hereditary epilepsy, and three forms of hereditary insanity. The physical diseases are hereditary blindness, hereditary deafness, and severe physical defects.

Dr. Hurst reports that from 80 to 90 per cent of cases of mental deficiency are due to heredity according to Mendel's laws. Injuries received ante- or postnatal account for the remainder of the cases of mental deficiency.

He believes that English research shows that all forms of mental deficiency are due to a series of recessive genes when the dominant gene for normality is absent.

Family data on which genetical conclusions are based may be collected from the observed effects of the German law on the population of that country. These data seem like the records of the hereditary influence observed in certain families where large contributions to crime and indigency flow through certain groups.

Dr. Hurst, however, shows that although the frequency of mental deficiency may be largely reduced through sterilization, since in certain families among siblings some may be abnormal and others super-normal, he estimates that for every four inferior individuals prevented through sterilization about three superior and six mediocre persons are lost to the nation. This, of course, is a serious objection if the facts warrant these statements.

One important benefit which would follow sterilization seems to apply to Huntington's chorea, which is handed on direct from parent to child, and which according to Dr. Hurst could be made to disappear under appropriately applied sterilization. Epilepsy also seems to be nearly in the same category as do those forms of insanity designated as manic depressive and schizophrenic which occur consistently in the studies of hereditary diseases. Enough has been taken from the report of Dr. Hurst's discussion to show the importance of sterilization as a protective measure in relieving society of great and growing burdens. That it is a very complicated problem is generally recognized, because it is an invasion of personal rights, but even so, the general scheme of civilization is the right of the community as against that of the individual, and as a general proposition, the individual must give way before the greater good.

In America it is probable that the sentiment of the people is not ready for the adoption of the German plan, and will be inclined to restrict compulsory sterilization to a small proportion of those who might properly be regarded as especially fit subjects for this treatment. Until public sentiment can be molded to look at the matter in a scientific spirit, it will be necessary to employ moral suasion in getting the largest possible number of assents to advice for the application of this treatment.

Meantime more study should be given to the subject. Careful reading of the digest of Dr. Hurst's discussion as it appeared in the *New York Times* of August 5, 1934 will prepare the way.

BENJAMIN WATERHOUSE

ALTHOUGH there has never been an official "Life" of Benjamin Waterhouse, the main facts in regard to his career are sufficiently well known not to need further comment. That he was born in Newport, R. I., the friend of Gilbert Stuart, and that he lived with his uncle, John Fothergill, for a number of years in London and later was graduated from the University of Leyden, only to return to this country to become the first professor of the Practice of Medicine in the Harvard Medical School and to be the pioneer in vaccination for smallpox in America are facts with which physicians are perfectly familiar. There are one or two interesting episodes, however, in Waterhouse's life which seem to have escaped most of the ordinary biographers. In 1778 he went to Leyden, where he lived during part of his medical course with John Adams and his two sons, then "publicly acknowledged as the American Minister", in spite of the fact that America was still at war with Great Britain. Waterhouse must be considered a patriot, although he left this country in 1775 rather than enter the American forces. Brought up in a highly intellectual atmosphere, it was felt that his education was of more importance than service in the Army. It is to be noted, however, that at Leyden he did not hesitate to write after his name, when he matriculated in 1778, the words *Liberae Reipublicae Americanae Foederatae Civis,* an inscription which caused considerable remark, as Waterhouse was the only American student and the British Ambassador rather dominated the situation. To his inaugural dissertation, which he gave on April 19, 1780, he added only the word *Americanus.* It is said that the University would not allow him to use any other expression, for America had not been recognized as a free Republic. Waterhouse found much sympathy for America in both Holland and England. His uncle, Fothergill, was, as he writes, "a conscientious advocate of the American cause, as far as a wise, loyal, and honest Englishman could or ought to be". Fothergill, moreover, was closely associated with Franklin and seems to have been one of the Englishmen who clearly saw the reasons for the American cause.

Waterhouse must be remembered also as an author and editor of books not strictly medical in character. On November 20, 1804, for instance, he gave a lecture to the Harvard students on morals, especially in regard to overindulgence in alcohol and tobacco. This lecture, published in 1805, became an important book. It was reprinted in at least five editions in America, one in London, one in Geneva (in French) and one in Vienna (in German). Waterhouse felt that the students' morals had somewhat deteriorated and also that consumption and nervous disorders were more in evidence than they had been in the past. Both of these he attributed to intemperance and it is possible that this warning was issued at a time when it was definitely needed. At all events, the famous "tobacco lecture" was widely read and probably was the most popular of all the contributions by Waterhouse.

A much more interesting controversy, however, from the literary point of view, has taken place in regard to an anonymous book which has been attributed to Waterhouse. This is a romantic narrative, "The Journal of a Young Man of Massachusetts," published in Boston in 1816 and subsequently going into a second edition. The book deals with the story of a young ship's surgeon captured by the British in the War of 1812, confined to Dartmoor Prison in England, who returned to America in 1815. It is written as an actual first-hand account and, incidentally, is a splendid description of life at sea and of the terrors of captives imprisoned at Dartmoor. If Waterhouse wrote this at the age of sixty-two, it throws new light upon his personality. The book is entirely different from any other contribution that we know was written by him. That a man who had been through such a marked emotional crisis, a few years before, when he was forced to resign from the Harvard Medical School, should be able to turn to an entirely new form of literature and produce a book of considerable worth when he was somewhat past middle age, throws a reasonable doubt in regard to attributing this book to Waterhouse. He was, however, always interested in young men and knew a good deal about the sea, having returned from Holland on the famous *South Carolina,* commanded by Alexander Gillon, at a time when there was mutiny aboard. Having lived in England, he might have been familiar with Dartmoor Prison. Waterhouse, moreover, took the notes of an-

other young man who had made a trip to Oregon and published them, some years later, largely written by his own pen. These factors are rather in favor of "The Journal of a Young Man of Massachusetts" having been written by Waterhouse. The point cannot be definitely settled, for there is no internal evidence in the book which allows us to draw a final conclusion.

These aspects of Waterhouse's life, therefore, give us a much broader point of view of the man than previous writers have noted. As one studies the various factors in the career of Benjamin Waterhouse, it seems obvious that perhaps of all the medical men of his time, he was one of the most extraordinary.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

MARBLE, ALEXANDER. A.B., A.M., M.D. Harvard University Medical School 1927. Physician, New England Deaconess Hospital. Assistant in Medicine, Harvard Medical School. His subject is "Diabetes and Cancer." Page 339. Address: 81 Bay State Road, Boston.

DOWNING, JOHN GODWIN. A.B., M.D. Harvard University Medical School 1915. Dermatologist, St. Elizabeth's and Beth Israel Hospitals. Assistant Dermatologist, Boston City Hospital. Teaching Assistant Dermatologist, Harvard University Medical School. Assistant Professor in Dermatology, Tufts College Medical School. His subject is "Care of Syphilis in the Out-Patient Department of the Boston City Hospital." Page 349. Address: 520 Commonwealth Avenue, Boston.

WEISE, ELLWOOD C. M.D. Jefferson Medical College of Philadelphia 1920. Assistant Dermatologist, Bridgeport Hospital. Dermatologist, City Dispensary, Bridgeport. Assistant Attending Dermatologist, Vanderbilt Clinic, New York City. Instructor in Dermatology, College of Physicians and Surgeons, Columbia University. His subject is "Another Case of Sporotrichosis in Connecticut." Page 353. Address: 144 Golden Hill Street, Bridgeport, Conn.

FROTHINGHAM, CHANNING. A.B., M.D. Harvard University Medical School 1906. Physician-in-Chief, Faulkner Hospital. His subject is "How Can the Individual or Family Secure the Best of Medical Care and Pay For It?" Page 357. Address: The Faulkner Hospital, 1153 Centre Street, Jamaica Plain, Mass.

FOWLER, EDMUND PRINCE. M.D. Columbia University College of Physicians and Surgeons, 1900. F.A.C.S. Director Surgeon, Manhattan Eye, Ear, Nose and Throat Hospital. President, The American Laryngological, Rhinological and Otological Society 1932. His subject is "Methods of Testing and Management of the Deafened School Child." Page 364. Address: 140 East 54th Street, New York City.

THOMPSON, H. K. A.B., M.D. Boston University School of Medicine 1922. Instructor in Medicine, Tufts College Medical School. Assistant Physician, Robert B. Brigham Hospital. Visiting Physician, Arthritis Clinic, Boston City Hospital. His subject is "A Simplified Concept of Arthritis." Page 370. Address: 589 Beacon Street, Boston.

WILLIAMS, HAROLD W. A.B., M.D. Syracuse University College of Medicine 1929. Formerly: Pathologist, Taunton State Hospital. Resident Pathologist, Rhode Island Hospital from 1929 to 1931. Address: Taunton State Hospital, Taunton, Mass. Associated with him is

HENDERSON, DONALD G. B.S., M.D. McGill University Faculty of Medicine 1931. Formerly: Resident Pathologist at Rhode Island Hospital. Now: Pathologist, Taunton State Hospital. Address: Taunton State Hospital, Taunton, Mass. Their subject is "Restoration of Autopsied Bodies. A Better Method." Page 371.

MISCELLANY

THE HOMICIDE RECORD

BY FREDERICK HOFFMAN, LL.D.

Capital crimes in the United States continue to imperil the security of life to an alarming degree. Our crime situation has of recent years become stabilized suggestive of a criminal industry of enormous extent. In the opinion of the Attorney General of the United States the army of criminals in this country at the present time is equal to the established military forces of the country.

Every day continues to reveal an inconceivable condition, as to which little enough is done by the authorities responsible for the maintenance of law and order. The life of no one is secure as is best illustrated by the audacious attack on the President which caused the death of Mayor Cermak of Chicago. Persons in conspicuous positions or high places are as readily slain as the most obscure wayfarer or tramp on the roadside.

While there are no statistics on the subject, nevertheless it would appear that blood lust on the part of countless numbers of men and women in this country is reaching unheard-of proportions. Brutal crimes to a considerable degree are committed by men and women of education and refinement sup-

posed to be outside the category of persons with criminal intent.

The annual toll of deaths by homicide is somewhere between 11,000 and 12,000, or equivalent to the number of inhabitants of a small town, sacrificed year after year to public apathy toward the root of the question involving the control of dangerous weapons on the part of the authorities. In 1932, out of some 11,060 deaths by homicide 7,447 were caused by firearms. The trade in concealable weapons continues unabated and practically the same is true of machine guns and sawed off shotguns and other weapons which should not be in the hands of private persons.

The homicide death rate of 1933 was practically the same as for the preceding three years. In thirty-one cities, for which I have uniform returns since 1900, it is shown that the murder death rate has increased from 5.1 per 100,000 of population in 1900 to a maximum of 11.3 in 1925, while since then it has fluctuated between 9.9 and 10.9. For the thirty-one cities under review, the total number of deaths by homicide during the thirty-four years, 1900-1933, was 58,915. But there are quite a number of deaths due to homicide which are classified as suicides or accidents in the absence of definite indications to the contrary.

Other nations the world over have decidedly lower homicide death rates than the United States. To show a more striking comparison I give below a table showing deaths from homicide and the rates per 100,000 for the United States and England and Wales.

HOMICIDE MORTALITY, UNITED STATES AND ENGLAND AND WALES

	United States		England and Wales	
	Deaths	Rate	Deaths	Rate
1930	10,590	9.0	194	0.5
1931	11,134	9.4	190	0.5
1932	11,016	9.2	186	0.5

—Excerpts from *The Spectator*, April 12, 1934.

SIXTH ANNUAL MEDICO-MILITARY SYMPOSIUM

THE MAYO CLINIC

The 1934 Medico-Military Symposium for Medical Department Reserve Officers of the Army and Navy will be held at the Mayo Clinic, from October 7th to 20th, both dates inclusive.

This is the Sixth Annual Inactive Duty Training Course to be held at The Mayo Clinic and will follow the plan which has proved so satisfactory in past years; that is to say, the morning hours will be devoted to attending clinics on subjects selected by the student officers, and the afternoon and evening hours given over to work in Medico-Military subjects. The Medico-Military program will be under the personal supervision of Colonel Kent Nelson, M.C., U. S. Army, Corps Area Surgeon, Seventh Corps Area, and Captain J. B. Mears, M.C., U. S. Navy, District Medical Officer, Ninth Naval District.

The staff and faculty of The Mayo Clinic have placed their unexcelled facilities at the service of their Government in the interest of preparedness and have extended an invitation to all the service to participate. The two weeks' excellent clinical postgraduate work must make a definite appeal to all who are interested in their profession and does not incur so great a loss of time for the private practitioner as normally pertains to postgraduate work along professional lines.

The general motif of the Medico-Military part of the Symposium will be "Public Health and Its Relation to National Defense." The problems of administration in military service present features not dealt with in private practice. In the great field of sanitation as applied to military service, the medical officer has a distinct specialty. This course offers valuable and interesting training for the medical officer in all the components of our national defense. A splendid program of a thoroughly practical nature has been carefully compiled and the speakers selected for their ability to present authoritatively the subject assigned to him.

Application for this course of Inactive Duty Training should be made either to the Corps Area Surgeon, Seventh Corps Area, Omaha, Nebraska, or to the District Medical Officer, Ninth Naval District, Great Lakes, Illinois. Applications should state the character of the work the candidate desires to follow in the morning hours. All student officers are expected to attend and participate in the afternoon and evening sessions. Each applicant should fully understand that the invitation to accept this course of study without charge is extended by The Mayo Clinic; that the project is without expense to the Government; and that one hundred hours' credit will be given those who take and complete the course. While it is desirable to attend the entire course, those whose time will not permit this may join or leave at any time and will receive credit for the hours spent in training. Uniforms are optional.

NOTICES

QUADRENNIAL PRIZE OF THE INTERNATIONAL FOUNDATION OF GYNECOLOGY AND OBSTETRICS

In order to perpetuate the intentions of the Committee having charge of the funds of the past International Congress of Gynecology and Obstetrics, the Administrative Council and the Consulting Committee of the Société Belge de Gynécologie et d'Obstétrique, the actual legal managers of the said funds, have decided to use the revenue of the

foundation for a prize of ten thousand Belgian francs, to be awarded every four years.

The prize will be given to the author of the best paper in Gynecology or Obstetrics published during the four years preceding the time of the award.

The papers presented for this prize must be published in the official languages of the International Congress, namely, German, English, Spanish, French and Italian, or translated into one of these languages.

Two copies of the paper must be sent to the Secretary of the Société Belge de Gynécologie et d'Obstétrique (Dr. Max Cheval, 16 Alphonse Hottat Street, Brussels, Belgium), twelve months before the fixed date for the award of the prize.

The Committee of Judges charged with the examination of the papers presented will be named by the Society, from its active, corresponding and honorary members, national as well as foreign and according to methods to be ultimately determined by the Society. The President of the Society will preside. The judges cannot take part in the contest.

The decision of the Committee of Judges will be made according to the majority of the votes. If no paper seems worthy of the prize, this will not be awarded and the amount will be added to the value of the next prize. The prize of the International Foundation of Gynecology and Obstetrics will be given for the first time, in July, 1938 at the time of the monthly meeting of the Société Belge de Gynécologie et d'Obstétrique.

THE NEW OFFICE OF DR. WARNSHUIS

The Michigan State Medical Society announces the retirement of its Secretary, Dr. F. C. Warnshuis, effective September 15, 1934. Dr. Warnshuis is leaving Michigan to assume the duties of Secretary-Treasurer of the California Medical Association on October 1, 1934.

On and after September 1, 1934, all communications related to Society affairs, business, advertising and exchanges should be addressed to Burton R. Corbus, M.D., Acting Secretary, 313 Metz Building, Grand Rapids, Michigan.

On and after October 1, 1934, Dr. F. C. Warnshuis's address will be Room 2004, 450 Sutter Street, San Francisco, California.

G. L. LeFevre, M.D., *President*,
B. R. Corbus, M.D., *Chairman*.

CORRECTION

In the *Journal* of August 16, page 334, it was incorrectly stated that John Willis Macy, M.D., received his M.D. degree from the Iowa Medical College at Keokuk in 1928. It should have read that he received his M.D. degree from the State University of Iowa College of Medicine, Iowa City.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

August 18 - September 30—Medical Study Trip to Hungary. See page 975, issue of May 10.

September 3-6—American Public Health Association, at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis. For information address the National Tuberculosis Association, 450 Seventh Avenue, New York City.

September 10, 11, 12, and 13—American Congress on Physical Therapy will meet in Philadelphia at the Bellevue Stratford. For details write American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago, Illinois.

September 10-15—First International Congress of Electro-Radio-Biology will be held in the Doges Palace at Venice. For details address the General Secretary of the Congress, Dr. Giocondo Protti, S. Gregorio 173, Venice (Italy).

September 18, 19 and 20—Tenth Clinical Congress of the Connecticut State Medical Society. See page 287, issue of August 9.

September 27 and 28—International Association for Preventive Pediatrics will be held at Lyons. For details address the Secretary of the I. A. P. P., 15 rue Lévrier, Geneva (Switzerland).

September 28-29—New England Surgical Society will meet at Burlington, Vermont. For details address the Secretary, Dr. John M. Birnie, 14 Chestnut Street, Springfield, Mass.

October—International Medical Postgraduate Courses. See page 335, issue of August 16.

October 7-20—Sixth Annual Medico-Military Symposium, at the Mayo Clinic. See page 382.

October 22 - November 2—1934 Graduate Fortnight of the New York Academy of Medicine. See page 1240, issue of June 7.

October 31 - November 2—Massachusetts State Nurses' Association, Hotel Statler, Boston. For information write Miss Helene G. Lee, R.N., 420 Boylston Street, Boston.

April 29 - May 3, 1935—The American College of Physicians will meet in Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

June, 1935—Medical Library Association will meet in Rochester, N. Y. For details address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

BOOK REVIEWS

A Primer for Diabetic Patients. By Russell M. Wilder. Fifth Edition, Reset. 172 pp. Philadelphia and London: W. B. Saunders Company. $1.75.

This excellent manual from the Mayo Clinic begins with a brief description of the nature of diabetes. The author leans toward defective utilization of sugar rather than its overproduction as the characteristic fault in diabetes. He emphasizes injuries to the pancreas from such causes as stones, tumors, infections and even hardening of the arteries in the etiology. The newer data on the influence of heredity in the etiology of diabetes are not sufficiently stressed.

The Benedict test is recommended for use twice daily, a rule which might well replace the single test.

A period of hospital observation is recommended for new patients in order that the tolerance for carbohydrate may be determined. Incidentally the patient gains much more than this if teaching in classes and by individual instruction is carried out. A sample observation diet is used containing 142 grams of glucose made up of carbohydrate 102 grams,

protein 60 grams, and fat 53 grams. From the amount of sugar excreted in this diet one can estimate some measure of the severity of the case. Insulin is recommended in all children. The author conservatively advises against any diabetic becoming obese. The most commonly used diet at the Mayo Clinic for maintenance is the B diet, carbohydrate 113 grams, protein 64 grams and fat 203 grams, Cals. 2535.

Brief detailed instructions in the use of insulin, the care of complications such as infections, coma and gangrene are given. The use of sodium bicarbonate in coma is still recommended by stomach or by rectum with the caution not to use more than 20-40 grams.

Clinical Miscellany. The Mary Imogene Bassett Hospital, Cooperstown, New York. Volume I, 1934. Contributors, Floyd J. Atwell, C. Lee Buxton et al. 206 pp. Springfield: Charles C. Thomas. $3.00.

The immortal Osler always emphasized the value of clinical reports, even of seemingly commonplace and unprofitable cases. All of us can testify to the sedimentation of many a grain of truth in the brainpan from reading such literature. The staff of a small hospital in a New York rural community has collected twenty cases of apparently puzzling nature, giving the results of study and the outcome. Surely it is significant to American medical progress when such an interesting and stimulating volume comes from such an ardent and enthusiastic group of workers, far from the metropolis. It shows that the best in modern medicine has been given, through the efforts of interested and energetic personalities, to the people far from the big centers. The cases in this group are thoroughly studied, the publication carefully edited, and the whole work deserves commendation. Particularly are the citizens of Cooperstown to be congratulated upon having such high-type physicians on the staff of their hospital.

Parasitism and Disease. By Theobald Smith. 196 pp. Princeton: Princeton University Press. $2.00.

This book is an expansion of a series of lectures on parasitism and disease delivered at Princeton. The wealth of experience and the ripe knowledge of Theobald Smith uniquely qualify him to discuss this problem of vital interest to all of us. The essential theme is a presentation of the conflict of man and domesticated animals against infectious disease agents. With wise restraint he has avoided the more recent and still controversial accessions to knowledge and has presented only the thoroughly established facts. I quote from his introduction: "However, the newest is not always the truest nor has it often the importance at first attached to it." The chapter headings give an idea of the comprehensiveness of the field: Predation and parasitism; The life cycle of parasites; Aberrant parasitism and incomplete cycles; The stage of conflict between host and parasite; Cell parasitism and phagocytosis; Variation and mutation among parasites; The survival of parasites and movement from host to host; Epidemiology; The utilization of discoveries in parasitism.

Only reading the book itself will give an understanding of the broad scholarliness that has placed Theobald Smith in the fore of his field.

Studies from The Rockefeller Institute for Medical Research. Reprints. Volume 89. 605 pp. New York: The Rockefeller Institute for Medical Research, 1934.

Of particular interest in this collection of reprints from the clinical standpoint are Rake's article on the carrier problem in meningococcus infection and Cohn's article on heart disease from the viewpoint of public health. In addition to these are papers dealing with a wide range of subjects covering the field of pathology and bacteriology, chemistry, chemical pharmacology, general physiology, physical chemistry, and biophysics. The ingenious use of magnetism to isolate Kupffer cells of the liver for study and growth in tissue culture is described by Rous, through phagocytosis by them of ferromagnetic iron injected into the blood stream of the animal. These cells are then selected from the others by the use of a magnet to attract them.

Handbook of Therapeutics. By David Campbell. Second Edition. Baltimore: William Wood & Company. 1934. $4.75.

The impelling necessity for occasional review by the busy practitioner is the "raison d'etre" of books such as this. Therapeutic advances in some fields are rapid and require competent condensation. To the average practitioner cannot be allocated the task of judicious choice and authoritative appraisal of the welter of therapeutic claims, nor is he in a position to examine critically the fields of experimental therapeutics.

This volume performs this task in a far more readable manner than merely a collection of abstracts. It is withal a text, and a good one.

As a British publication we find the Harrison narcotic act substituted by its British companion act. To an American, weight expressed in "stones" is unintelligible. An American edition should have taken these facts into consideration. Again, in this country one would hardly classify thrombo-angiitis obliterans as a "rare" disease of the arteries. There is still considerable doubt as to the efficacy of excision of the lumbar sympathetic ganglia in this condition, as recommended by the author, even though he qualifies it by specifying "in early cases confined to the lower limbs". An illustration (p. 26) of venipuncture should be corrected by having the ends of the tourniquet away from the operator. Fungus diseases such as moniliasis have not received any consideration in spite of their rising importance.